THE

DENTAL Digest

MARCH 1945

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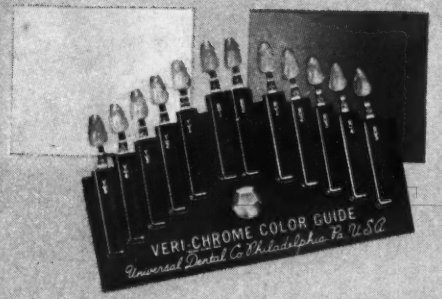
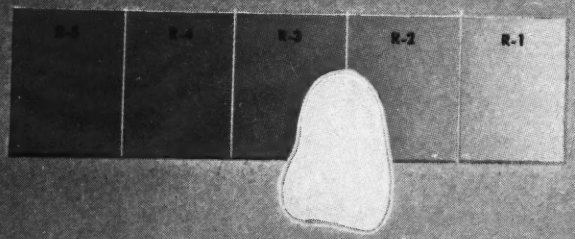
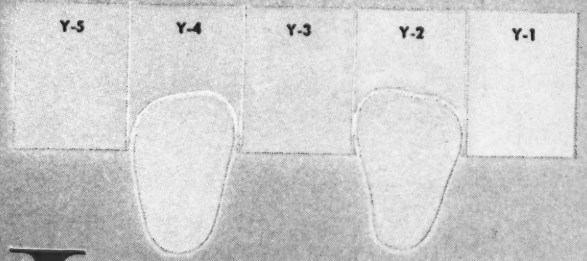


Is the tooth yellow or is it reddish-yellow?

Hue (color) is visually emphasized when contrasted with another hue.



"Contrast-comparisons" distinguish between saturations of the same color.



All teeth are basically yellow. Some are tinged or modified with red. Each category is so identified in the Veri-chrome Color Guide. Each category shows and identifies its full range of tooth color saturations in progressive order.

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THE DENTAL Digest

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EDWARD J. RYAN, B.S., D.D.S., *Editor*
ETHEL H. DAVIS, A.B., *Assistant Editor*
In Military Service

RUTH K. BARNHART, *Assistant Editor*

708 Church Street, Evanston, Illinois

About Our CONTRIBUTORS

MAX GRATZINGER, (M.D., University of Vienna, 1916; D.D.S., 1939, and M.S., 1944, University of Illinois) stresses periodontia in his general practice. He has done research, particularly in periodontia, in the Department of Therapeutics of the College of Dentistry, University of Illinois, for the last five years. Doctor Gratzinger describes his method of ELIMINATION OF PERIODONTAL POCKETS BY CHEMICAL CAUTERY.

LIEUTENANT EDWARD A. REYER (DC) AUS has his D.M.D. from Tufts Dental College, class of 1935. Lieutenant Reyer limited his practice in New York City to prosthetics prior to entering the Service. He emphasizes the importance of peripheral seal in his presentation of a FULL LOWER IMPRESSION PROCEDURE.

SAUL LEVY (B. S., 1924, and D.D.S., 1926, University of Illinois, College of Dentistry) is in general practice. He was editor of the Alumni Bulletin of his dental college from 1934 to 1938. Doctor Levy answers six of the most popular questions regarding REINFORCEMENT IN ACRYLIC BRIDGE CONSTRUCTION.

A. G. SCHNACK (A.B., Stanford University, 1910; A.M., Yale University, 1911; M.D., Johns Hopkins University Medical School, 1915) is engaged in roentgenology and internal medicine in Honolulu. He is the author of numerous medical and dental articles. Doctor Schnack discusses THE ACID GASTRIC REFLUX AS A CAUSE OF DENTAL CARIES.

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Elimination of Periodontal Pockets by Chemical Cautery

MAX GRATZINGER, M.D., D.D.S., M.S., Chicago*

The treatment of periodontitis is one of the major problems of the dental profession and an important factor in the maintenance of dental and general health. One of the decisive steps in this treatment is the elimination of periodontal pockets which cannot be managed satisfactorily by conservative treatment.

Potassium hydroxide paste is a suitable therapeutic agent for the elimination of periodontal pockets. The action of the drug is effective and easily controlled. It does not affect the tooth in any of its parts, and the danger of hemorrhage and infection is eliminated.

The technique developed for the use of potassium hydroxide paste is simple, safe, and inexpensive. It can be performed by every general practitioner of average skill and experience. Laboratory and clinical studies show that the potassium hydroxide paste described here is a valuable addition to the dentist's armamentarium for the elimination of periodontal pockets.

It is emphasized that potassium hydroxide is a powerful caustic and must be used with extreme caution.

Fig. 1—Before treatment: The gingiva of the right upper central incisor is slightly swollen, and there is purulent exudate from the pocket on the distal surface.

THE COMPLEX problems which confront the dental profession arise mainly from three sources: dental caries, periodontal disease, and malocclusion. The management of malocclusion is almost entirely in the hands of specialists; but the other two, caries and periodontal disease, are within the scope of every general practitioner. Successful and complete restoration of even extensive carious lesions is routine for every dentist; however, the situation with respect to periodontal disease is quite different.

Even the dentist well trained in this particular field will be limited in his achievements. The best result he can obtain is to bring the disease to a standstill, inasmuch as there is no possibility of restoration of those important structures which have been destroyed. Consequently, it becomes evident that periodontal disease gravely endangers the integrity of the masticatory unit.

Although the loss of any tooth involved is a serious matter, there is still another aspect which makes the management of periodontal disorder mandatory to health service. The importance of periodontal pockets as foci of infection must be borne in mind. The frequent occurrence and the effect of this disease justify the demand that every general practitioner should be able to treat periodontitis successfully.

Periodontitis, the advanced stage of chronic periodontal disease, is characterized by the presence of periodontal pockets. There are numerous methods of treatment of periodontal pockets, but most of those which have been found successful are complicated, requiring special training and skill or expensive apparatus, or both. The management of periodontal pockets by the chemical cautery method can be performed successfully and safely by every general practitioner. The method is safe, simple, and inexpensive.

Types of Treatment

There are two general philosophies concerning the treatment of perio-

*From the Department of Therapeutics, University of Illinois, College of Dentistry.

dontal pockets, each with its advocates:

1. The conservative group, which believes that reattachment of the periodontal membrane to the cementum may occur, or at least that the pocket may be ignored if suppuration does not persist.

2. The radical group which denies that reattachment is possible and believes that the pocket must not be allowed to persist, demanding the reestablishment of a gingival crevice of normal depth by eradication of the soft tissue wall of the pocket.

Conservative Treatment—The first group is represented by Box,[1] Leonard,[2] Miller,[3] and Stillman and McCall,[4] who assert that reattachment as a clinical phenomenon has been observed, though in isolated cases. In their opinion the epithelium which grows down at the inside of the pocket is the essential barrier to reattachment, and the removal of this epithelium is essential. Therefore, they recommend curettage or the use of a drug, sodium sulphide, which accomplishes chemically the removal of this epithelium. Proof of reattachment has not been given, however, by histologic specimens from a single patient, and the roentgenographic evidence alone is certainly not conclusive.

Radical Treatment—The second group is represented by Coolidge,[5] Gottlieb,[6] Haeupl and Lang,[7] and Kronfeld.[8] Gottlieb is of the opinion that it is impossible to bring about reattachment of the connective tissue to the cementum by any treatment. Kronfeld asserts that reattachment is impossible inasmuch as once the cementum has become denuded and exposed, it is a dead surface in a biologic sense.

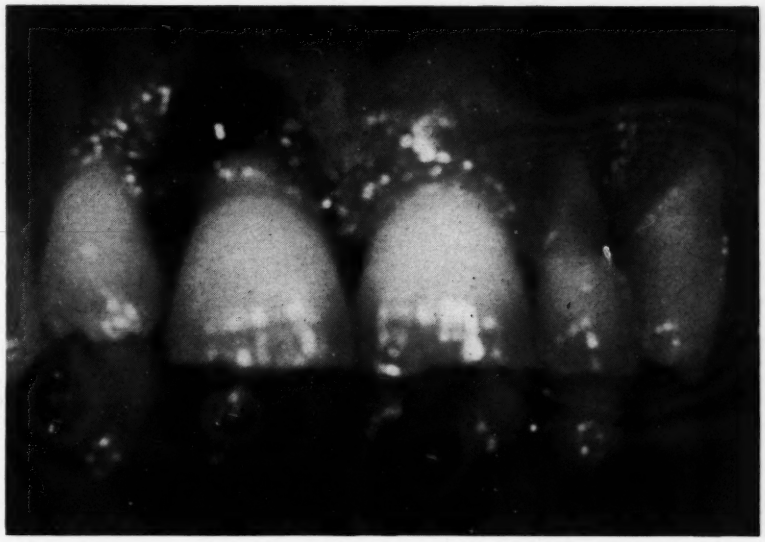


Fig. 2—Appearance immediately after application of potassium hydroxide paste: The coagulated tissue is sharply demarcated.

Haeupl and Lang admit that reattachment should be possible according to the theory of bone pathology, provided the surface of the cementum could be made sterile. Inasmuch as this is not possible, reattachment cannot occur.

On the other hand it is becoming generally accepted that pockets should not be allowed to persist, as they tend to increase in depth, and suppuration will recur. Haeupl and Lang refer to the question in the following way: "Thus the periodontal pocket, the result of inflammation itself, becomes a condition which favors and permits the further development of inflammatory processes." The same opinion is expressed in much more elaborate form by Coolidge. He conclusively describes the vicious cycle that persists as long as any periodontal pocket is present, and he concludes that the complete elimination of the pocket and the institution of proper mouth hygiene are the only means of checking it.

Methods of Treatment—If one does

Fig. 3—Appearance immediately after third application of potassium hydroxide paste: The pocket is reduced by the previous application, and freshly coagulated tissue is sharply marked.

[1]Box, H. K.: Treatment of the Periodontal Pocket, Toronto, The University of Toronto Press, 1928.
[2]Leonard, H. J.: Conservative Treatment of Periodontoclasia, J.A.D.A., **26**:1308 (August) 1939.
[3]Miller, S. C., and Arvins, A. N.: Periodontia in Internal Medicine, New York, S. J. M., **41**:359, 1941.
[4]Stillman, P. R., and McCall, J. O.: A Textbook of Clinical Periodontology, New York, The McMillan Company, 1937.
[5]Coolidge, E. D.: Elimination of the Periodontal Pocket, J.A.D.A., **25**:1627 (October) 1938; Periodontitis, the Periodontal Pocket of Inflammatory Origin, Illinois D. J., **12**:3 (January) 1943.
[6]Gottlieb, B.: Schmutzpyorrhoe, Paradentalpyorrhoe, und Alveolaratrophie, Vienna, Urban und Schwarzenberg, 1925.
[7]Haeupl, K., and Lang, F. I.: Marginale Paradentitis, Berlin, Hermann Meusser, 1937.
[8]Kronfeld, R.: Clinical Pathology of Periodontal Pocket, J.A.D.A., **27**:499 (April) 1940.

Fig. 4—Appearance after completion of treatment: The gingival tissue around the right upper central incisor is light pink with no signs of inflammation, and the pathologic pocket has been eliminated by the destruction of its soft tissue wall with the potassium hydroxide paste.

not believe in reattachment, the only possible way of pocket elimination is to remove the soft tissue wall of the pocket or to extract the tooth. The techniques applied for pocket elimination with the tooth in place may be divided into the following classes:

A. Conservative methods (one or more may be used):
   1. Prophylaxis.
   2. Zinc oxide-eugenol or paraffin packs.
   3. Interdental stimulation.
   4. Subgingival curettage.

B. Methods of Pocket Elimination:
   1. Surgical:
      a) Gingivectomy.
      b) Flap operation.
   2. Electrocoagulation.
   3. Chemical cautery.
      a) Paraformaldehyde (protracted action).
      b) Cautery with potassium hydroxide paste (immediate action).

A most thorough and meticulous prophylaxis *must* precede or accompany any method of treatment. As a prerequisite for every method of treatment in class B, perfect mouth hygiene should have been established and all symptoms of acute inflammation of the soft tissues should have subsided. Means of accomplishing this are scaling, irrigation, adequate toothbrush technique, packs, and interdental stimulation. Having done this, everything has been accomplished that conservative treatment (class A) is capable of achieving. In cases of gingivitis or of shallow pockets not more than 3 millimeters in depth, such treatment alone may be successful. Deeper periodontal pockets require a more drastic technique which will cause destruction or removal of the soft tissue wall of the pocket.

Pocket Elimination by Chemical Cautery

The method of pocket elimination described here belongs to the class of treatment by chemical cautery. Numerous caustics have been used in the treatment of periodontal pockets: Silver nitrate in different dilutions, zinc chloride (8 to 10 per cent), lactic acid, copper sulfate, and others; all these are of limited efficiency.

Chemical cautery requires a substance which destroys soft tissue almost on contact, does not attack any part of the tooth itself, and can be applied and controlled easily. Inorganic acids have to be eliminated because they attack the tooth proper and cannot serve as suitable agents for this purpose. Organic acids are either too weak or not self-limiting; therefore, an investigation was made to find a suitable agent in the group of alkaline caustics.

Potassium hydroxide was found to be a substance which meets all the necessary requirements. According to the Dispensatory of the United States,[9] "It destroys organic tissue rapidly. Probably because of its powerful effect in dissolving soft tissues it is a potent escharotic. It is the strongest common caustic. Its action is not only thorough, but it penetrates more deeply than either silver nitrate or nitric acid."

It does not affect the tooth in any of its parts and its action can be stopped immediately by flushing the treated tissue with plain water, an advantage which gives absolute and easy control over the extent of destruction.

Potassium Hydroxide Paste

The application of plain potassium hydroxide, solid or pulverized, has not been found suitable for the purpose of pocket elimination. It has, therefore, been brought into the form of a stiff paste which makes the application of the drug easy and safe, without hampering its efficiency.

The formula of this paste is as follows:

Potassium Hydroxide	9.0 grams
Magnesium Carbonate	0.3 "
Thymol	0.3 "
Oil of Peppermint	0.3 "

Glycerin to produce a stiff paste.

Poison! For external use only.

The formula for the paste is the result of several attempts to compose a suitable preparation. Magnesium carbonate and glycerin represent a vehicle for the potassium hydroxide without entering into any chemical reaction. They provide the desired bulk and consistency. Thymol and oil of peppermint are added to correct the somewhat unpleasant taste, and seem to improve the stability of the paste.

This prescription results in a stiff paste, which should be kept in a tightly sealed jar, preferably with

[9]The Dispensatory of the United States of America, Philadelphia, J. B. Lippincott Company, Twenty-first edition, **1926**:886.

adhesive tape, inasmuch as it is extremely hygroscopic. In this way potassium hydroxide has been brought into a form which makes its application simple and safe.

Indications for Use of Paste—The treatment with the potassium hydroxide should be applied only in cases in which the conservative treatment was ineffective. Before treatment with this method, the patient must be given a thorough prophylaxis, and all acute symptoms of gingival inflammation must have subsided. In case of suppurating pockets, the suppuration should have been eliminated by frequent irrigation, or should at least have been reduced to a minimum.

Contraindications—It is contraindicated to treat any acutely inflamed tissue with the paste because an inflammatory reaction produced by the action of the paste superimposed upon a present inflammation could result in complications or at least in discomfort for the patient.

Method of Application—1. I have found a smooth broach tipped with cotton, or any blunt instrument such as a periodontal explorer, to be the most suitable applicator.

2. The amount of paste to be applied varies according to the amount of tissue to be treated. The average application requires a spheric mass of 1 to 2 millimeters in diameter.

3. The area to be treated (Fig. 1) is isolated with cotton rolls and dried as well as possible with compressed air.

4. A suitable amount of the paste is placed upon the crest of the gingivae and distributed with the applicator in such a way that it works evenly downward. To reduce the soft tissue wall of periodontal pockets, the caustic agent must be worked from the gingival crest down to the epithelial attachment and from the outside toward the tooth.

5. The soft tissue changes its appearance immediately after contact with the paste so that the amount of destruction can be observed easily (Figs. 2 and 3). As soon as the destruction has proceeded to the desired extent, plain water is flushed over the area to stop the action. The depth of the pocket should not be reduced more than 3 millimeters at one time.

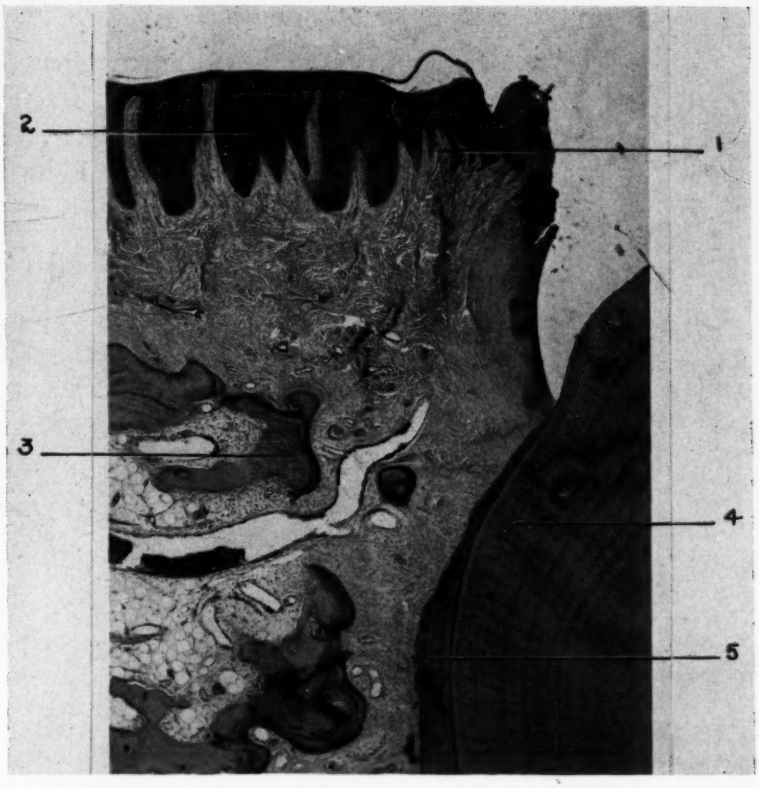


Fig. 5—Photomicrograph of gingival tissue of dog cauterized with potassium hydroxide paste just prior to fixation of tissues. Note destruction of the epithelium, superficial coagulation of subepithelial tissue, and absence of bone resorption. (1) Zone of epithelial destruction and of coagulation of subepithelial tissue. (2) Normal epithelium. (3) Alveolar bone, (4) Dentine. (5) Cementum.

6. The action of the paste is rapid, and the amount of pain which results is usually tolerated well even by sensitive patients. An anesthetic is never required and there is no hemorrhage.

7. The coagulated soft tissue turns into a brownish mass which can be partly removed merely by wiping it off. The rest of the coagulated tissue which acts as a protective dressing will be eliminated by the natural tissue reaction within two to three days. Epithelization takes place quite readily and the active inflammation disappears in about five days. The treatment should be continued at intervals of two to seven days until a gingival crevice of normal depth has been established (Fig. 4).

Precaution

It should be emphasized again that potassium hydroxide is an extremely powerful caustic, and must be used with caution. The areas treated should be limited to six in one sitting, and the smallest amount of paste still effective should be used.

Laboratory and Clinical Investigations

To evaluate the effect of potassium hydroxide paste on tooth structure, freshly extracted teeth were partly covered with potassium hydroxide paste for ten minutes, thirty minutes, and seventy-two hours. The teeth were then dried and examined under a low power microscope. No gross change in appearance of the enamel or cementum was observed. Inasmuch as the technique of application of this caustic does not permit contact to the tooth for more than sixty seconds, it is evident that the tooth structure will not be affected.

Another experiment was performed on twenty areas of the gingivae of a

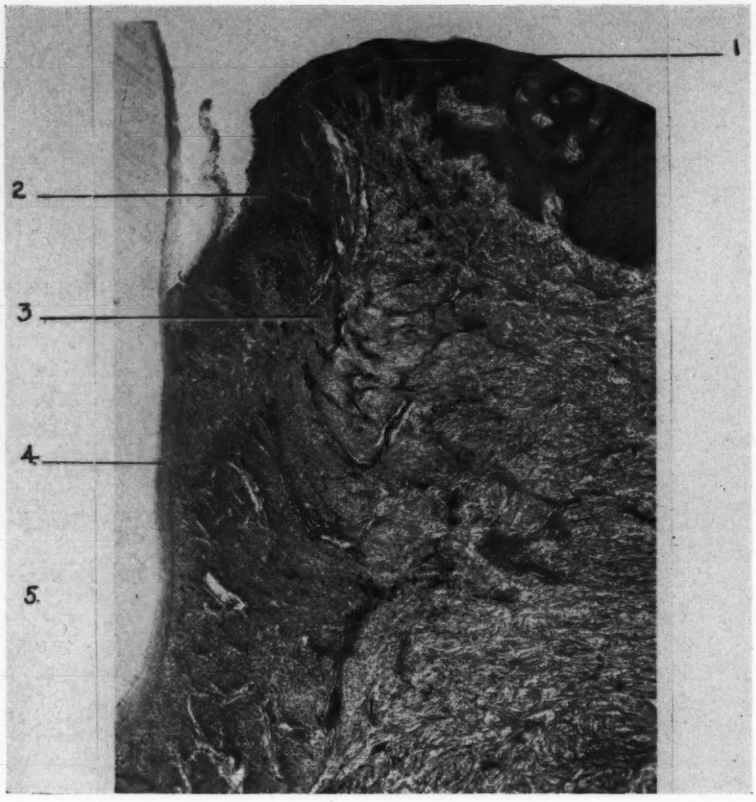


Fig. 6—Photomicrograph of gingival tissue of dog cauterized with potassium hydroxide paste seven days prior to fixation of tissues. Note proliferating epithelium covering the area of gingival tissue treated with paste. (1) *Gingival epithelium.* (2) *Crevicular epithelium (not yet intact).* (3) *Round cell infiltration.* (4) *Cementum.* (5) *Dentine.*

dog to investigate the action of the paste and the reaction of the tissues during the process of regeneration. The results of this experiment demonstrated that the immediate action of the drug is complete destruction of the epithelial and adjacent subepithelial tissues upon which a thin layer of coagulation is found (Fig. 5); there is only normal tissue underneath the layer of coagulation. It was interesting to observe that during the days following the application of the paste the inflammatory reaction in the underlying tissue was amazingly small, and that the epithelization was almost complete seven days after treatment (Fig. 6).

The clinical study based upon treatment of well over one hundred cases of periodontitis with pocket formation demonstrated that the method is effective. No complications of any kind could be observed. Inasmuch as the possibilities of conservative treatment were almost exhausted before the potassium hydroxide paste was used, all the pockets treated were free of acute inflammation and showed none or only moderate suppuration.

The amount of tissue destroyed in one sitting did not exceed 2 to 3 millimeters in depth. The time which elapsed between sittings was long enough to allow the acute inflammatory reaction to subside. This usually required five days. After this time the inflammatory reaction of the tissue had disappeared entirely, but the epithelization was not yet complete.

Satisfactory results were observed in all the cases treated. The results were so encouraging that there is every reason to believe that the method can be recommended for use by every general practitioner.

25 *East Washington Street.*

THE COVER

THIS MONTH, THE DENTAL DIGEST dedicates its cover to the American Red Cross so as to provide publicity for the current drive, in the hope that dentists will be reminded of the organization's need for money to carry on the great work it is accomplishing in a war-torn world. The photograph, taken somewhere in New Guinea by Harry Poague, Red Cross correspondent, shows the grass-thatched native building which was converted into the first American Red Cross Service Club in this theater of war. "Papuan natives quickly developed interest in the Yanks relaxing there, and two are seen paying an informal call," says the Red Cross. This month, THE DENTAL DIGEST's companion paper, ORAL HYGIENE, has also dedicated its cover to the Red Cross.

Full Lower Impression Procedure

Lieutenant EDWARD A. REYER (DC) AUS

Inasmuch as retention of a denture depends on the complete sealing of its borders against the ingress of air, the technique of sealing the most neglected areas is described. Every advantage is taken of the soft tissue to enhance the sealing of a denture base. Careful consideration given to the steps outlined will bring gratifying results.

THE PURPOSE of any impression is to obtain as true a negative "picture" as is possible with the present day materials. Whether the denture is to be an upper or a lower, the first prerequisite for its success is peripheral seal.

Equipment

Select a tray, such as one of the Gutterman design. It is sometimes necessary to reduce the standard height of the tray flanges to facilitate finger manipulation, as will be described later. The tray should be of such size as not to distend the cheeks noticeably. On measuring the tray to the ridge, the flange should be about ⅛ inch beyond the labial and buccal walls of the ridge.

Use a nonresinous and high-fusing compound. It will set hard in a short time without the use of cold water in the mouth. A short, sharp knife blade, a blow torch, and zinc oxide-eugenol paste are the other necessary materials.

Anatomic Landmarks

The various anatomic landmarks and borders with their nomenclature should be located for better understanding and visualization.

1. The distolingual, or pharyngeal, border (A in Fig. 1) is governed by the widest opening of the mouth by the muscles located in the anterior wall of the pharynx. It is not always necessary to allow an accentuated sweep of this border posteriorly to gain peripheral seal.

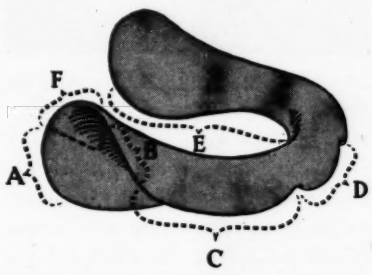


Fig. 1—Lower Baseplate: (A) Distolingual, or pharyngeal, border; (B) distobuccal border; (C) buccal border; (D) anterior border, or labial arch; (E) lingual border; and (F) posterior border.

2. The distobuccal border of the mandibular denture is formed by the posterior portion of the buccinator muscle. It is also greatly influenced by the anterior edge of the masseter muscle (B in Fig. 1).

3. The buccal border (C in Fig. 1) begins from the curve of the distobuccal border to the buccinator attachment anteriorly near the cuspid line. It is in contact with the horizontal fibers of the buccinator muscle.

4. The anterior border, or labial arch (D in Fig. 1), is formed by the orbicularis oris muscle. The left and right sides of the arch are interrupted by the attachment of the labial frenum.

5. The lingual border (E in Fig. 1) extends from its posterior curve to the lingual frenum, from the distolingual border to the frenum. It is established by the mylohyoid muscle, and the sublingual gland anteriorly. The lingual border terminates where the genioglossus muscle begins to influence the formation of that border in the area of the lingual frenum.

6. The posterior border of the lower denture is governed by the pterygomandibular ligament at the base of the retromolar triangle, or pear-shaped area. It may be palpated with a suitable instrument, such as the T burnisher. This border (F in Fig. 1)

Fig. 2—Fully extended lower preliminary impression. Note roll of buccal border and flatness of lingual border.

is located just posterior to the hard retromolar tubercle.

Impression Technique

1. Soften two cakes of compound and shape them into a roll to correspond with the ridge. Shape the intaglio area to conform approximately to the depth that the ridge will make. The compound should not flow at this stage. Chill one third of the tray side of the compound so that the impression does not work itself down to expose the metal tray. Maintain at least ¼ inch of hard compound at the heels.

2. After glazing the tissue surface of the compound with a brush flame, being careful not to burn the material, dip it in tepid water and carry the tray into the mouth. Roll the tray into the mouth first on one side, then the other, while the muscles of the cheeks and lips are completely relaxed. Hold the tray in position so that it is centered over the ridge, and mold the compound well against the walls and slightly beyond the normal extension on one side and then the other, buccally, labially, and lingually, with the fingers of the free hand.

3. Remove and chill the first seating (Fig. 2). Reduce all width, but not height. Flame the tissue surface of the compound lightly, and cool, to obtain a more accurate registration of the tissue areas. Examine the extension of the borders by distending the cheeks slightly horizontally to see if all borders are in contact with the roll of the tissues. The lingual borders can be examined by having the patient extrude the tongue a short distance. Add compound where deficiencies exist.

4. In muscle-trimming, start with the distobuccal and buccal borders of one side up to the buccinator attachment. Soften the border to a depth of not more than ⅛ inch. With the mouth slightly open to allow two fingers to retain the tray at the bicuspid area on each side and the thumb beneath the chin, distend the cheek slightly horizontally, and then apply slight inward or medial pressure to complete the peripheral roll in this area. It must be stressed at this point

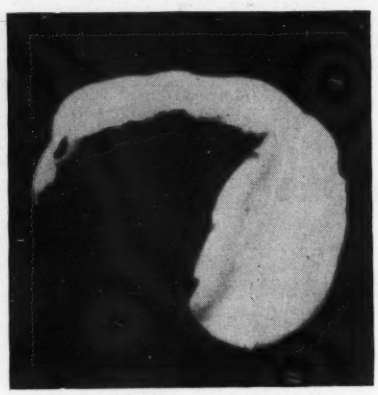


Fig. 3—Lower wash impression. Note the definite borders and retromolar pad.

that muscle trimming entails *no strenuous upward tugging* of the cheeks or lips. It will only foreshorten the borders and give a false vestibular roll. Trim the other side in the same manner.

5. Soften the anterior border ⅛ inch on both sides with a dry brush flame, and lift the lip away from the ridge to prevent distortion while inserting the impression. Muscle-trim this border, using the index finger and thumb to pucker the lip; then draw the lip upward slightly in a rotary fashion in the region of the frenum. Puckering of the lip causes the compound to flow to its correct height by the slight pressure exerted on it.

It will be noted that every advantage is taken of the soft tissue in the distobuccal and buccal areas situated beyond and lateral to the external oblique line. This is contrary to the once accepted technique of extending these borders to the external oblique line. The same feature of extension is applicable to the linqual borders. The extension goes below the mylohyoid line sufficiently to gain added retention. The lingual flange will then be found to be high in the posterior area and gradually shallower toward the anterior area. From observations of lower denture impressions it has been revealed that in overextending the lingual borders a compromise must be reached whereby the greatest degree of extension for retention is obtained with a minimum amount of resultant irritation.

The reason for this compromise is apparent from the physiology of the genioglossus and mylohyoid muscles and the sublingual gland in the anterior part of the floor of the mouth. The entire concept of initial retention is peripheral seal. If the tissues are not completely in contact with the surfaces of the borders, the resultant leakage of air will cause an upward floating of the lower denture.

6. The lingual border is the most widely neglected border of all surfaces. If constant contact can be maintained between the lingual border of the denture and the tissues, and if tissue contact can be main-

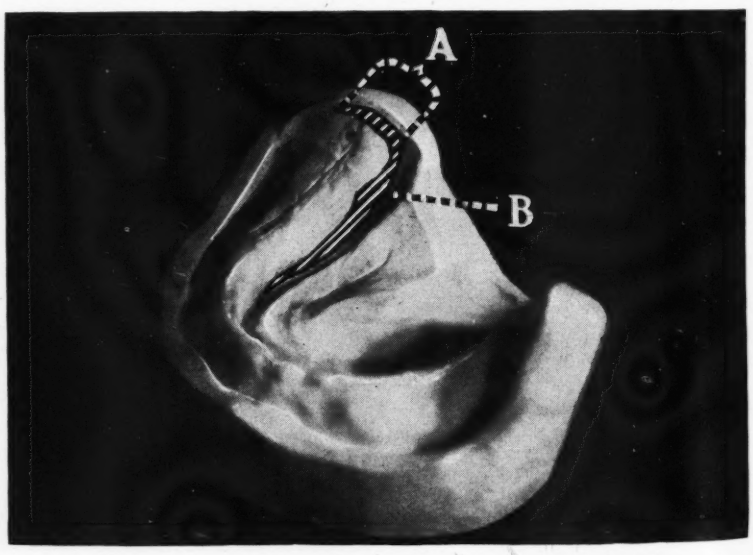


Fig. 4—(A) Posterior border, or base of retromolar triangle; (B) shaded area, showing scarification of lingual surface of model for sealing, merges with A.

tained on the buccal and labial borders, the mandibular denture will be satisfactorily retentive. To obtain lingual muscle trim, soften the distolingual border first on one side. Temper the border with warm water and carry the compound tray into the mouth. Instruct the patient to open the mouth as wide as possible. Then soften the other side and repeat the procedure of opening the mouth. This will register the distolingual extension.

7. Both right and left lingual borders are now flamed to a depth of 1/8 inch, as previously described, and the compound tray is carried into the mouth. Instruct the patient to extend the tongue to the outer part of the vermillion border of the lips. With a side-to-side motion of the tongue, limited to the corners of the mouth, a satisfactory registration of the lingual border will be obtained.

The lingual border (Fig. 2) will not appear as a roll, but as a horizontal sweep from the mandible. The final width of this border will be determined by tissue tolerance. It should never appear as a knife-edge border. This applies to all borders. Repeat the described procedures until all borders are satisfactorily trimmed.

8. In testing for extension, place the compound impression over the ridge; distend the cheek slightly first, and bring the borders of the impression down to the tissues. If a great displacement is noted, the border can be considered overextended. Correct this with further muscle-trimming. The test will also determine the degree of retention of the compound impression. If all borders contact the tissues properly, a retentive sucking sound will be heard upon breaking the seal and removing the impression. If no such sound is noted, feel for poor contact in the distolingual areas. By adding soft carding wax on the lingual surface of the ridge in the area of the distolingual border and reinserting the impression, the leakage may be found to be corrected, provided all other discernible areas are in contact with the tissues.

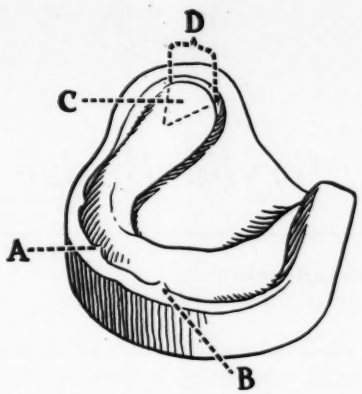


Fig. 5—Lower Model: (A) Labial frenum; (B) buccinator attachment; (C) retromolar triangle; (D) posterior border.

9. Figure 3 shows the impression after trimming with a zinc oxide-eugenol paste "wash." This is now boxed to preserve the definite border outline of height and width. Soft retromolar pads should be relieved in the compound, as well as other flabby ridge areas, before taking a "wash" impression. A stone model is made from this impression, ready for the final processing of the denture (Fig. 4).

10. The retention of the lower denture can be increased considerably by employing postdamming. Extreme care must be taken, however, to ascertain the depth of tolerable compression where the damming is to be placed. The shaded areas, A and B, in Figure 4 illustrate the approximate places of damming.

11. Prepare a shellac base tray that extends the full posterior length of the ridge. Run an indelible pencil across the posterior border of the tray and transfer it to the ridge. This marking made at the posterior border in the mouth (D in Fig. 5) should correspond to that border on the model. A T burnisher run directly over this area will determine the correct length of the heel. This area will be found to be slightly compressible. Test this border from its distolateral angle, within a 1/16-inch width, to the distomedial angle for compressibility. Palpate the posterior lingual tissue adjacent to the mandible up to but not including the border. The placeable tissue here represents a triangular area of about 3/8 inch. The tissue is further palpated as far as the sublingual gland.

12. With this test in mind we are now ready to scarify the model in the same areas that were tested for compressibility. The greatest depth of scarification is in the posterior lingual region to a depth of not more than 1 millimeter, and gradually disappearing toward the sublingual gland. The posterior border scarification is also continuous with the posterior lingual surface but only to a depth of 1/2 millimeter and disappearing toward the buccal. Any irritation or strangulation of tissue may be alleviated later by adjustments after the denture has been worn for twenty-four to thirty-six hours.

Unsolicited Manuscripts Are Welcome

"When you have made an observation of value or reached a conclusion concerning the unusual, publish it. Avoid carrying unpublished knowledge to the grave!"—Sir William Osler.

Reinforcement in Acrylic Bridge Construction

SAUL LEVY, B.S., D.D.S., Scranton, Pennsylvania

We approach the subject of reinforcement in acrylic bridge construction by asking six important questions:

1. What metal is most practical?

2. How should it be constructed?

3. How should it be attached to the abutment teeth?

4. When should it be used?

5. Where should it be placed?

6. What constitutes the proper design?

What metal is most practical?

The bridge pontic or pontics can be only as strong as the skeletal reinforcing framework. This framework must, therefore, be constructed from a metal or alloy strong enough to withstand all the stresses and strains of mastication. Inasmuch as methylmethacrylate resin has a minimum elongation of 5 per cent, it is essential that the percentage of elongation of the metal or alloy be under 5 per cent. Otherwise there is the danger of setting up a tension within the acrylic which will cause it to fracture.

Bridge abutments are usually made of one of the many popular gold alloys on the market. Because the reinforcing material is cast or soldered to either one or both of these abutments, a gold alloy meeting the forementioned requirements should be the material of choice.

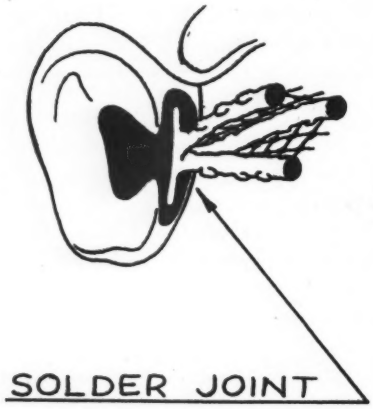


Fig. 2—Proper type of joint when soldering reinforcing frame to abutment.

How should the reinforcement be constructed?

A ready-made bar, regardless of type, bent and placed between the abutments to which it is soldered, should never be used. *Always cast the reinforcing framework to fit the individual case.* Use Kerr's 16-gauge or 18-gauge round wax sprues, and Williams retention mesh for molding the skeleton (Fig. 1). Stipple around the wax sprues with wax beading to retain the acrylic. Always avoid having sharp angles and protruding prongs or points for retention in the frame. Under the stresses of mastication, wherever there is contact with a sharp angle or point, a strain is set up within the acrylic that may eventually result in its fracture.

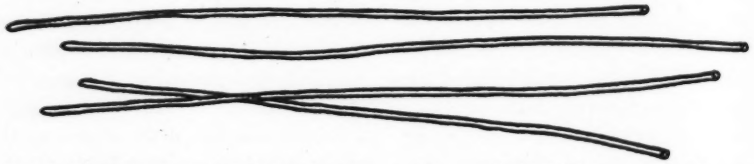
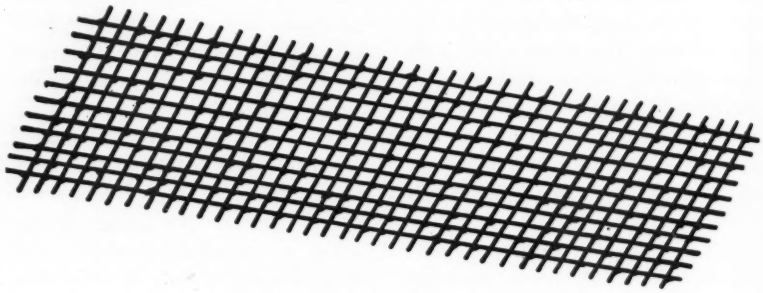


Fig. 1—Round wax sprues (above) and retention mesh (below) come already prepared and marketed.



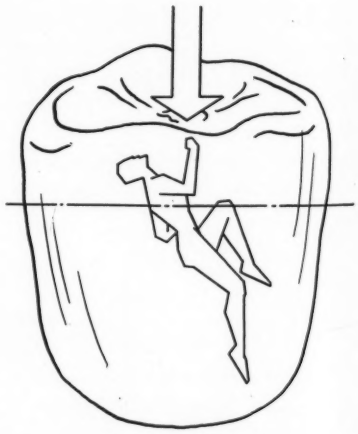


Fig. 3—Locating center of gravity of a bridge pontic by the application of a man running against air pressure. Arrow indicates air pressure in illustration of running man, or occlusal force in illustration of bridge pontic. Broken line indicates center of gravity in both cases.

Fig. 4A—Man sitting on rod can be unseated by slight dislodging force.

Fig. 4B—Man sitting on flat board can be unseated by application of slight dislodging force.

Fig. 4A

Fig. 4B

Fig. 5—Man sitting in chair cannot be unseated even by a strong dislodging force.

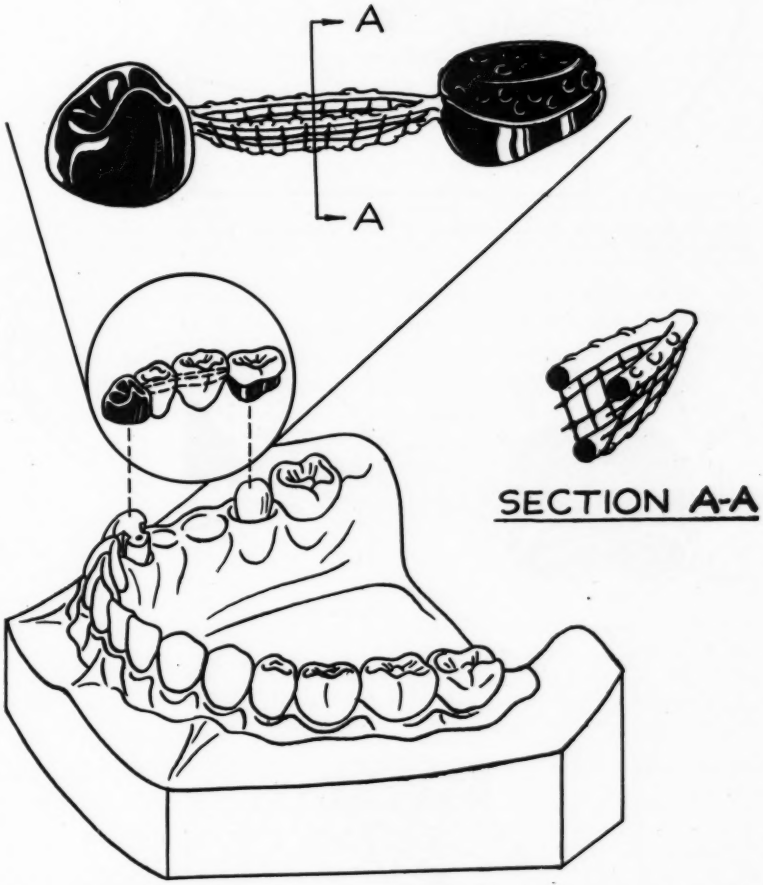


Fig. 6—Bridge restoring missing lower right second bicuspid and first molar. Above: Three-quarter crown abutment on first bicuspid; thimble crown abutment on second molar; and attached reinforcing frame. Insert: Finished bridge; pontics and coronal portion of second molar in methylmethacrylate.

How should the reinforcement be attached to the abutment teeth?

With the accurate casting techniques used today, the use of a one-piece casting, the frame and abutments cast together, is advisable. In this way it is possible to obtain a smaller and better contoured joint between the metal skeleton and the abutment. Furthermore, a more esthetic contouring of the acrylic in the finished bridge is possible. The soldering method may be used, however. In making the joint, it is important to remember, in order to obtain the greatest strength and the best esthetic results, that the long (incisogingival or occlusogingival), narrow

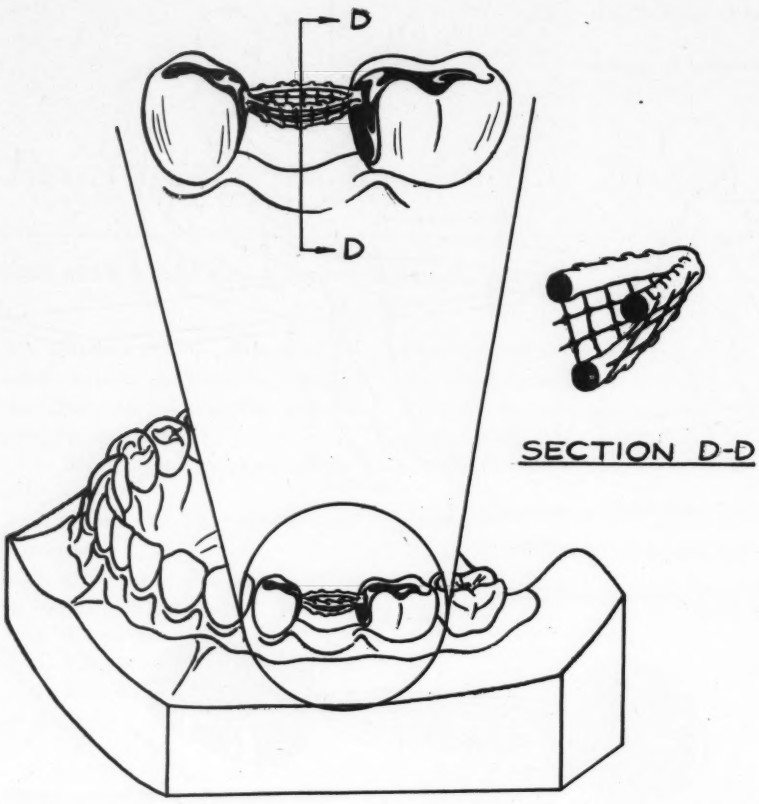


Fig. 7—Reinforcing frame attached to inlay abutments for restoration of missing lower left first molar.

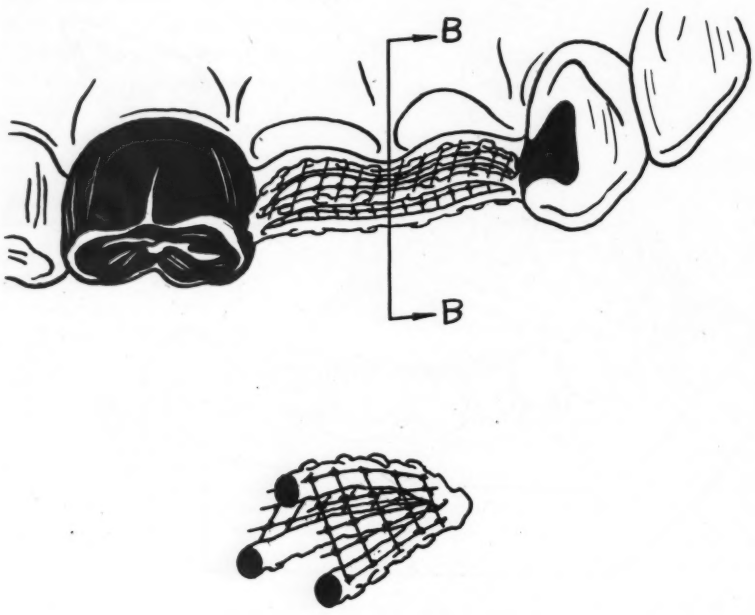


Fig. 8—Reinforcing frame attached to inlay abutment upper left cuspid and gold crown abutment upper left first molar.

(labiolingual or buccolingual) type should be made (Fig. 2).

When should a reinforcement be used?

A properly designed skeletal reinforcement can be used only where the bite has sufficient clearance to permit the necessary bulk of both metal and acrylic without interfering with either occlusion or esthetics. Reinforcement should be used almost always when one or more teeth are being replaced.

Where should the reinforcement be placed?

Whether or not a bridge is practical depends on the functional balance of its component parts. A simple illustration of the point of balance in a pontic tooth under occlusal stress is that of a man running: His center of gravity is actually balanced between his feet and the invisible pressure of air in front of him (Fig. 3). The reinforcement should, therefore, be placed so that its center of gravity is along the imaginary line dividing the occlusal third from the middle third of the pontic.

What constitutes the proper design?

Most of the designs used for reinforcing acrylic bridges fall in the flat bar type, the round bar type, or modifications of both. Any prongs or fancy additions to the round or flat bar can serve only to retain the material better, inasmuch as they have no actual reinforcing value. To visualize the weakness of these types of reinforcement, refer to Figures 4A and 4B. The man in A is sitting on a rope or rod, the man in B on a flat board; both are unseated by a slight dislodging force. By applying this physical principle to bridge construction we find that if the round bar type is used the acrylic will have a tendency to twist on the bar during the course of lateral excursions, with resultant weakening of the material and finally fracture at the joints or interproximal pontic areas. If the flat bar type reinforcement is used, constant lateral forces cause a shearing

along the bar itself with the consequent splitting or separating of the acrylic along the bar.

After considerable thought and experimentation, we decided to embed the acrylic material *within* a reinforcing network rather than to place it around or between bars. We complete our series of human illustrations by showing a man firmly seated in a chair (Fig. 5). He cannot be unseated even by a strong dislodging force without upsetting the entire chair. Likewise, in bridge construction, the reinforcing network retains the material without the lateral stresses doing any damage unless to unseat the bridge itself. Proper construction of the bridge abutments, however, would prevent anything like this from happening. The practical application of this principle is shown in Figures 6, 7, 8, and 9.

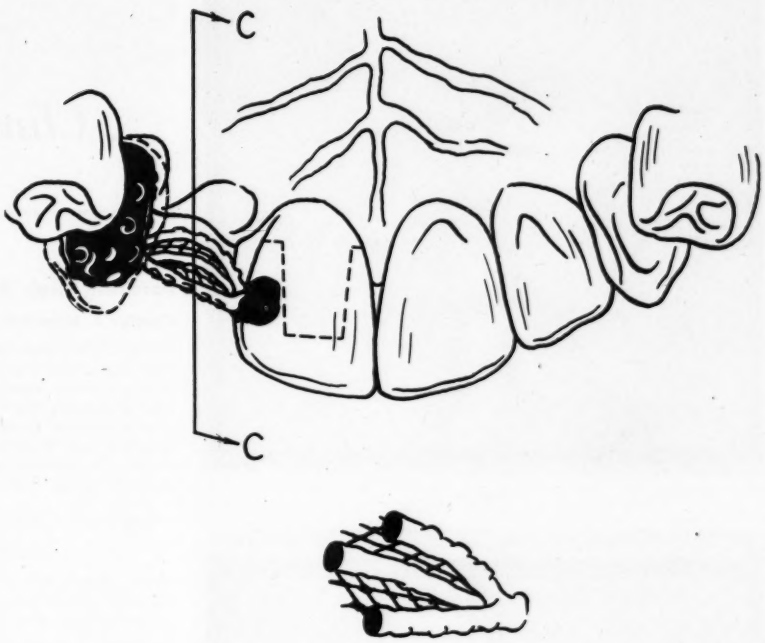


Fig. 9—Reinforcing frame attached to lingual rest in acrylic crown on upper left central incisor and thimble crown on upper left cuspid.

Conclusion

It has always been the aim and ambition of every dentist to restore missing teeth and destroyed tooth structure with a material closely reproducing nature's creation. The development of plastics in today's fast changing industrial world has given methylmethacrylate resin to the dental profession. This material is nearer the ideal than anything used thus far. Methylmethacrylate resin has great possibilities provided its limitations are thoroughly understood. Like every other material used or operation performed in dentistry, the acrylic resin *offers no short cuts*, and, for the best results, must be treated with the same sedulous care. We believe that in bridge construction, methylmethacrylate resin, if used with properly prepared abutments and carefully designed reinforcing frame, will provide a natural-appearing substitute for missing teeth—a substitute for which the dental profession has searched a long time.

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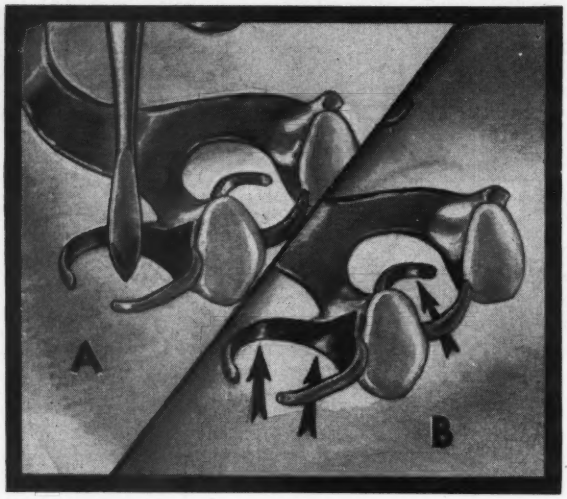

Fig. 1

Locating High Spots Inside of Clasps

Chester J. Henschel, D.D.S., New York City

Fig. 1—Dry the clasp, and flow black carding wax in a fine film over the inside surface (A). Insert the appliance to its proper position. then remove. The high spots in the metal will be revealed through the wax (B). These are the areas to be relieved The procedure should be repeated until the clasp fits in place satisfactorily. This technique may likewise be employed to detect where the denture material of a prosthetic appliance impinges upon the tooth structure.

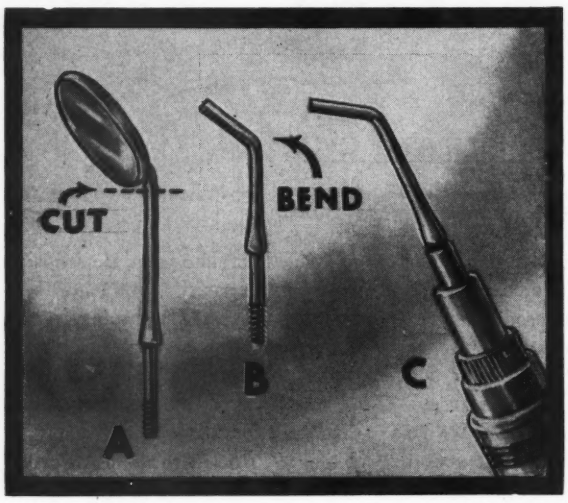

Fig. 2

An Amalgam Condensation Point Made From an Old Mirror

S. Salem Fabe, D.D.S., Beverly Hills, California

Fig. 2—Unscrew the mouth mirror from its handle, and cut the mirror from the shank with a Joe Dandy disc (A). Bend the shank to the desired angle (B). The amalgam condensation point thus formed can be inserted into the automatic gold foil plugger for easy use.

Cleaning Diamond Discs and Stones

Jacob Seidenberg, D.M.D., Chelsea, Massachusetts

Fig. 3—Pour ½ teaspoon of oakite (household cleaner) into ½ glass of water. Soak the diamond discs and stones in the solution for ten minutes, scrub them with a laboratory brush, and wash with clean water.

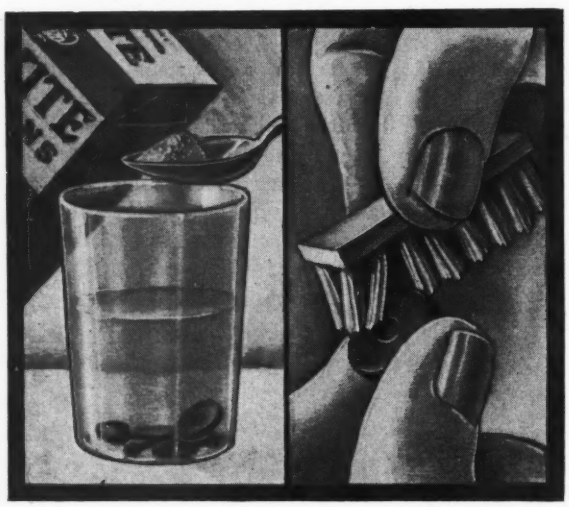

Fig. 3

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SUGGESTIONS . . . .

Increasing the Absorptive Power of a Cotton Roll

Martin H. Berman, D.D.S., Floral Park, New York

Fig. 4—Open the fold of a 2-by-2 exodontia sponge, and wrap it around a number 3 cotton roll. The gauze can be held in place with a small strip of Scotch tape. The gauze-wrapped cotton is much more absorbent than the plain cotton so it is recommended for use in areas of the mouth which are especially difficult to keep dry.

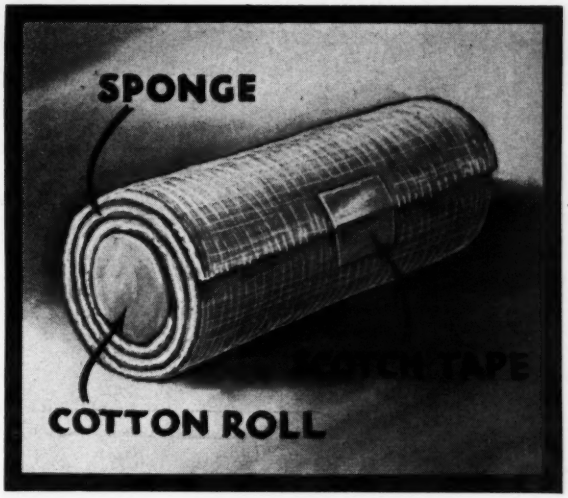

Fig. 4

An Individual Impression Cup Without Soldering

Joseph Berenbaum, D.D.S., Fort Defiance, Arizona

Fig. 5—Festoon a copper band of the proper size, and cut a circle of baseplate ¼ inch larger than the copper band. Hold the band over a Bunsen flame (A) for a few seconds, and press the hot band into the baseplate (B). Allow to cool. An impression cup is produced with sufficient baseplate extension to act as a handle (C).

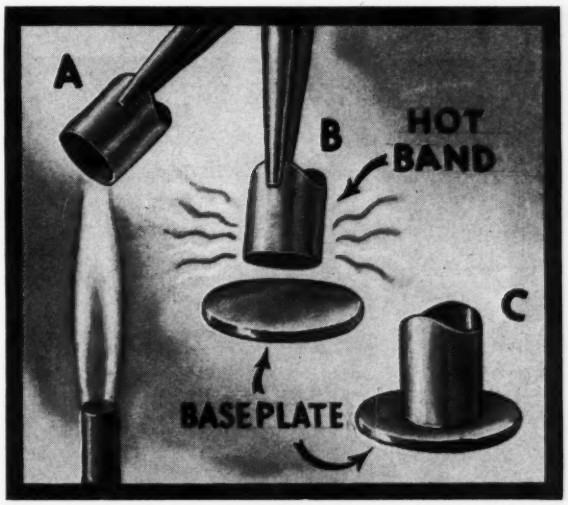

Fig. 5

A Syringe Nozzle for Treating Oral Infections with a Continual Hot Water Spray

Lloyd C. Robinson, D.D.S., Richmond, Virginia

Fig. 6—Hold one end of a discarded procaine tube over a blue Bunsen flame. When the glass is red hot, grasp the hot end of the tube with heated pliers and draw the tube out to the desired size. The tenuous tube may be snapped off at a file or stone mark after it is cool. The jagged end may be smoothed and the desired curve obtained by holding the tube over the flame. This glass nozzle can be pushed easily into the rubber tube leading to the fountain syringe. The nozzle is used effectively in treating gingival infections, molar flaps, and cellulitis when continual application of heat is necessary.

(*Continued on page* 134)

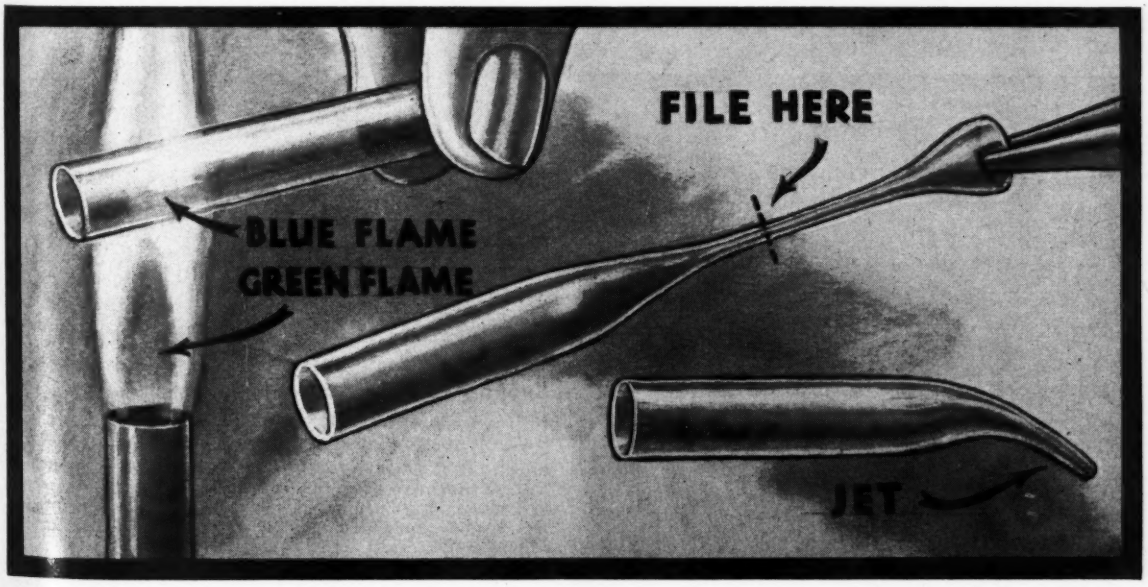

Fig. 6

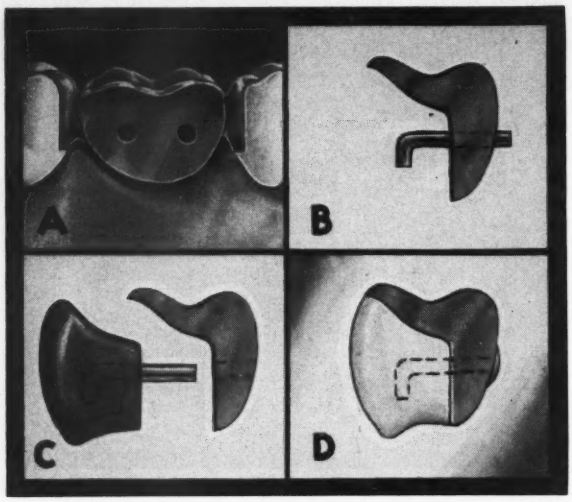

Fig. 7

Repair of a Broken Bridge Facing

Daniel Samuels, D.D.S., Brooklyn

Fig. 7—Remove the pins from the backing of a broken bridge, and drill two parallel channels through the gold to the lingual (A). Fit round clasp wire through the holes to allow projections of 1/16 inch onto the lingual surface, and bend the buccal extensions of the wire into L shapes for retention (B). Cover the pin with wax and contour properly. Withdraw the wax with the wire retention (C). Process in the proper shade of acrylic. When finished, place and cement the acrylic facing in its proper position, and finish off the lingual excess flush with the lingual contour of the bridge (D).

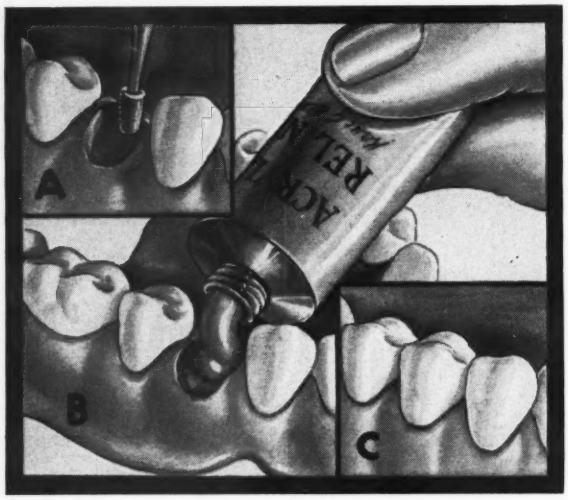

Fig. 8

Quick Repair of a Broken Acrylic Denture Tooth

Leonard Keller, D.D.S., Chicago

Fig. 8—Select an acrylic tooth of the desired mold and shade. Grind out the lingual (about 2 millimeters) of the tooth area in the denture (A). Insert an acrylic relining material in the space in the denture (B), and push the acrylic tooth into position (C). The tooth and the relining material will fuse with the denture acrylic. Polish the acrylic the next day.

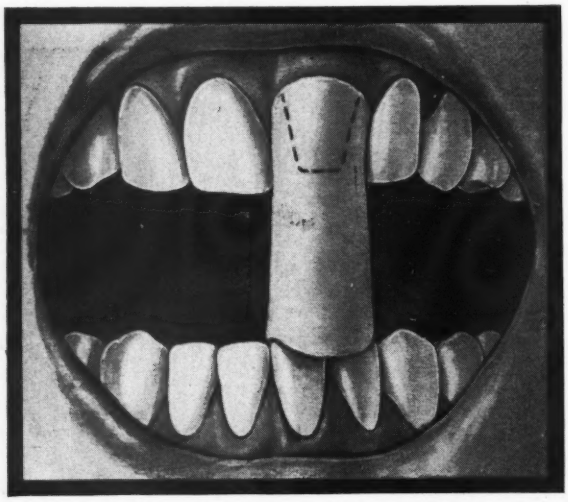

Fig. 9

Keeping a Jacket Crown Preparation Dry

Hyman Freedman, D.D.S., New York City

Fig. 9—Place a cotton roll in a vertical position in the mouth to cover the tooth preparation. This allows the opposing teeth to occlude with the cotton roll. This method keeps the preparation dry, controls bleeding from the soft tissues, protects the preparation against atmospheric air, and acts as a prop to discourage closure of the jaws.

SUGGESTIONS (*Continued from page 132*)

Insuring Proper Setting of the Die in Jacket Crown Construction

Henry L. Desatnek, D.D.S., Brooklyn

Fig. 10—Cover the metal working die with a piece of .001 tin foil (A). Heat low-fusing metal to the melting point. Chill the tin foil-covered die, and insert it quickly into the molten metal. Repeat the process until a low-fusing metal covering is built over the tin foil (B). This matrix can be contoured properly with a hot spatula and stones. The metal die jacket can be marked on the labial or buccal surfaces to aid in identification and retention when the plaster impression is taken (C). After the impression is made, the working die will go to place in a positive and accurate position in the impression.

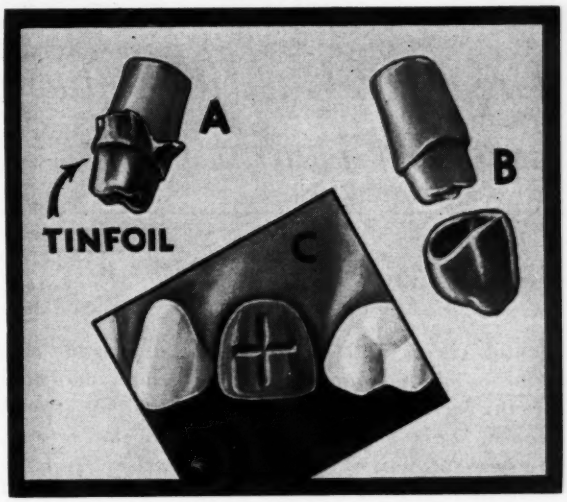

Fig. 10

A Lingual Matrix for Anterior Silicate Restorations

Philip H. Sheridan, D.D.S., Dubuque, Iowa

Fig. 11—A modeling compound matrix is constructed for the lingual area in placing anterior restorations. The celluloid strip is held in place on the lingual with the matrix. Bring the celluloid strip around the tooth anteriorly and hold it firmly in place over the restoration. This procedure ensures proper lingual contour and makes it possible to condense the silicate more thoroughly.

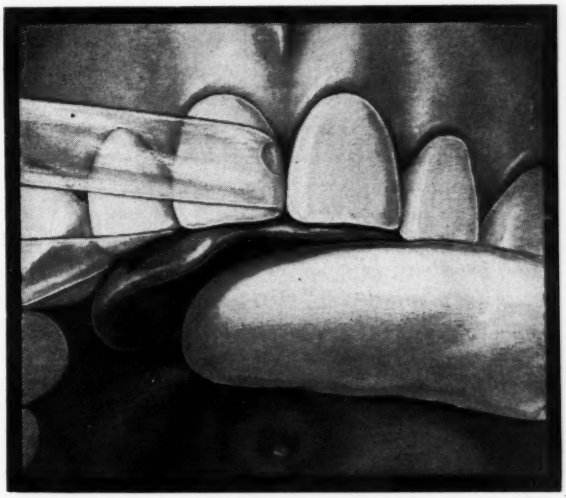

Fig. 11

Removing a Fixed Bridge Without Damaging the Abutments

Alexander Swett, D.D.S., Brooklyn

Fig. 12—Straighten a paper clip, and thread one end of it through the space between the pontic and the ridge as close to the abutment as possible. Twist the two ends of the clip to form a loop. Insert one end of a crown remover through the loop in the clip; then give several sharp blows to the crown remover in line with the long axis of the tooth. The same technique can be used effectively to remove full crowns, three-quarter crowns, and dowel crowns.

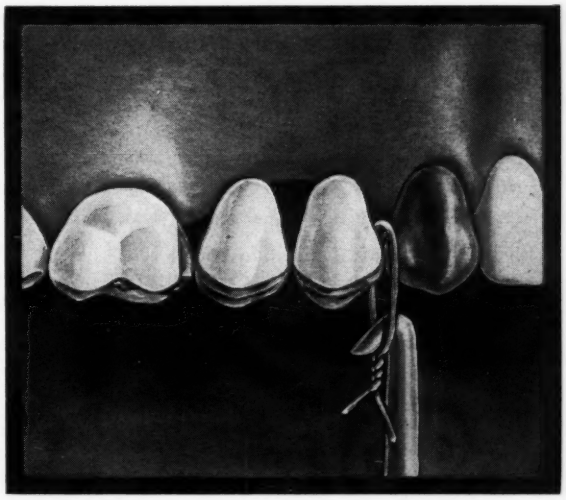

Fig. 12

The Acid Gastric Reflux as a Cause of Dental Caries

A. G. SCHNACK, A.M., M.D., Honolulu, T. H.

Dental caries is the result of solution of the enamel lime salts by the action of acids in the mouth. This acid comes from the fermentation of organic food material in the mouth, and from the reflux of stomach material into the mouth.

The stomach contains hydrochloric acid which destroys the buffer action of the saliva and perhaps also directly attacks the enamel if in sufficient concentration. Under normal conditions the gastric gradient carries food in an orderly manner from the mouth toward the rectum. This gradient can be reversed easily in a number of different ways, all of which, however, require that a point of greater nerve irritability be established at some lower point in the stomach or in the lower alimentary canal. Such points of irritability may be established through reflex excitation of nerves of the gastro-intestinal tract through irritation of the higher nerve centers (brain and medulla), through the various nerve ganglia, and, perhaps more important, through the direct irritation of nerves in the gastro-intestinal mucosa. A gastric reflux, often imperceptible and depending on the nervous sensitivity of the stomach, will result whether the cause of the gastric upset is in the central nervous system, arises from parenchymal conditions, or is to be found in direct nerve irritation in the gastric mucosa.

The amount of acid regurgitated will determine the degree of destruction of the alkaline buffer that normally protects the teeth against destructive acids. With the destruction of the buffer, the dental structures are open to attack by the organic acids from oral fermentation and perhaps the acid regurgitated from the stomach. The patient's nervous system figures importantly inasmuch as the tendency to regurgitate is much greater in some people than in others and some have a greater gastric acidity than others. Candy, alcohol, and nervous worry, figure in this way as being the most important gastric irritants in our present day increase in caries. Nature has established safeguards against dental caries when a normal life is led and natural foods are eaten, but we destroy these with unnatural foods and a nervous, worrisome way of living.

THE CAUSES and prevention of dental caries are still unknown despite the serious attention given to them by innumerable investigators.[1] Diametrically opposite opinions are found in many of the published results of extensive investigative work. Seemingly good results in the prevention of caries often are ascribed directly to the influence of some one factor while other explanations are ignored completely.

Dietary Factors

It is apparent that diet is important in the structural development of teeth, especially in regard to the effects of vitamins on dental growth. According to Harris,[2] vitamin A is essential for the proper development of all dental and periodontal tissue and vitamin C is essential for the full activity of osteoblasts, odontoblasts, and ameloblasts. Lack of vitamen C is important in the production of a so-called systemic periodontitis. Harris also states that vitamin D deficiency produces teeth that are more subject to caries.

Despite authorities, questioning of patients with extensive dental caries fails to show what can be called important vitamin deficiency, and the bone structures may show radiographically the greatest possible bone density. In considering dental caries, it must be accepted that a full quota of vitamins does help to produce well formed dental structures.[3]

It has been stated that acid-ash residue diets (rice diet of the Oriental) are conducive to dental caries, in contradistinction to the alkali-ash residue diets of the Caucasian (meats, vegetables, fruits). Many Orientals who make rice the main element of their meals each day show no evidence of dental caries in their permanent teeth.

Calcium Metabolism

Aub[4] considers caries as being linked definitely with general body calcium metabolism. Studies with radioactive phosphorus have shown

[1]Dental Caries: Findings and Conclusions on Its Causes and Control. Compiled for the Research Commission of the American Dental Association, Lancaster, Pennsylvania, Lancaster Press, 1939.

[2]Harris, R. S.: Role of Nutrition in Dental and Oral Health, J.A.D.A., **28**:424 (March) 1941.

[3]Albright, Fuller; Bloomberg, Esther; Castleman, Benjamin; and Churchill, E. D.: Hyperparathyroidism Due to Diffuse Hyperplasia of All Parathyroid Glands, Arch. Int. Med., **54**:315-329 (September) 1934.

[4]Aub, J. C.: The Importance of Calcium Metabolism in Internal Medicine, Calif. Acad. Med., 1930; Calcium and Phosphorus Metabolism, Harvey Lectures, 1928-1929.

that such phosphorus may be detected in the enamel of adult teeth, although in much smaller quantity than in the dentine or in unerupted, developing teeth.

Rampant Dental Caries

A rampant type of dental caries which begins as soon as the tooth starts to erupt has been named "odontoclasia."[5] It appears in both weak and robust babies. In a previous article on caries,[6] I ascribed this form of caries to the pampering of infants with sweets. The salivary glands secrete about 1500 cubic centimeters of saliva a day, the greater part of which is secreted during the waking hours. The oral state during sleep, therefore, offers the best possible conditions for stagnation and concentration of acid from fermentation. A short candy debauch is all that is necessary to create this condition.

Enamel, which is made up mostly of calcium, magnesium, phosphates, and carbonates, will become disintegrated only through the action of acids. These acids have only a few sources: (1) They may be taken into the mouth in fruits, citrate candies, and vegetables, and in hydrochloric acid (a digestive aid); (2) they develop in the mouth through fermentation of carbohydrates or proteins; or (3) they are regurgitated from the stomach. It is my contention that imperceptible regurgitation from the stomach is a most important contributory factor toward the development of dental caries.

Salivary Acidity

Saliva, we know, is generally amphoteric in its reaction but has great buffer value[7, 8] due mostly to the presence of alkaline phosphates and carbonates in solution, and perhaps to its ammonia content. The slight ionization of these products keeps the hydroxyl ion concentration low, while the saliva still possesses great acid-neutralizing power. The titratable alkalinity of the saliva is a measure of its protective action against any acid concentration at any point in the oral cavity. Boyd and Drain[9] insist that the acid-base imbalance induced by ordinary diets or changes in the serum calcium and phosphorus are not significant in dental caries.

Hubbell and Koehne[10] claim no difference in the hydrogen ion concentration and carbon dioxide capacity of the blood in children with and without caries, but detect a considerable difference in the titratable alkalinity of the saliva. The hydrogen ion concentration of saliva as secreted varies between 5.5 and 7.0, which can have no lime-dissolving action. The loss of buffer through diminished secretion or through neutralization by acids would destroy greatly the protective function of the saliva against caries.

Saliva may be more fluid and show considerable variability in its chemical content in different people. The fluidity and quantity of saliva, which normally approximates 1500 cubic centimeters daily, should through dilution of any oral acid be a deterrent to caries formation. Dentists often will say that dental caries seems to be associated with thick, ropy saliva which would hardly serve as a good diffusing medium.

Food Fermentation in the Mouth

Inasmuch as little saliva is secreted during the sleeping hours, oral stagnation and chances for oral fermentation are magnified greatly. Easily fermentable carbohydrates, such as the sugars, certainly would ferment readily in the mouth in sleeping hours under the influence of a predominating fermenting organism. Organisms most frequently implicated in such fermentation are *Bacillus lactoacidophilus, Bacillus aerogenes,* lactobacilli, staphylococci, and *Streptococcus viridans.*[11] *Bacillus lactoacidophilus* apparently is capable of functioning in considerably higher acid concentrations than most of the acid-producing organisms and is probably important in the development of caries.

That certain foodstuffs tend to adhere to the tongue, teeth, and periodontal tissue is probably of great importance in the production of caries. Hawaiians living on a primitive diet show almost no caries. Poi, the mainstay of this diet, is a glutinous, soft, partly fermented, starchy material that sticks to any dry object but does not adhere to the tissues in the wet oral cavity, thus does not leave any oral residue[4] for acid fermentation. That the absence of caries in these people should be attributed to the alkali-ash residue obtained on burning the material hardly needs comment, although for a while there was much discussion about foods with alkali-ash residues preventing caries. Hawaiians who eat a great deal of poi but indulge in white man's food to some extent generally have severe caries.

Gastric Reflux

I shall try to expound a theory which I consider paramount in dental caries. The theory has been arrived at through long association with medical and dental problems, the latter mostly through the interpretation of dental roentgenograms for twenty-five years. Such experience, if carefully considered, can be of as much importance in this problem as work carried on in a laboratory, but much experimentation will be required to confirm the theory.

Nature has a way of doing the right thing in time. We adjust ourselves to changes in environment and food after thousands of years. The available food or food tendencies have developed our digestive characteristics. Such facts of nature should not be ignored, and much of my argument is based on them.

Gastro-Intestinal Pattern — The mechanism of gastro-intestinal activity follows a general pattern which moves food and fluids from the mouth

[5]Jones, M. R.; Larsen, N. P.; and Pritchard, G. P.: Dental Disease in Hawaii, D. Cosmos, **72**:439 (May) 1930 and **72**:574 (June) 1930.
[6]Schnack, A. G.: Dental Caries, J.A.D.A., **19**:62-82 (January) 1932.
[7]Klein, Henry; McCollum, E. V.; Buckley, S. S.; and Howe, P. E.: Relation of Diet to the Skeletal Development of Swine, Including the Development of Teeth, J.A.D.A., **17**:782-804, 1930.
[8]Klein, Henry; and McCollum, E. V.: Age as a Factor in the Calculation of the Relative Percentage Incidence of Dental Caries in Rats on Stock and Deficient Diets, J. D. Research, **11**:745-746, 1931.
[9]Boyd, J. D., and Drain, C. J.: Dietary Control of Dental Caries, J.A.D.A., **17**:738-741, 1930.
[10]Hubbell, R. B., and Koehne, Martha: Effect of Varying Sugar Intake on Nitrogen, Calcium, and Phosphorus Retention of Children, Am.J.Dis.Child., **47**:988-992 (May) 1934.
[11]McCollum, E. V.: Moderator for Research Conference on the Cause and Prevention of Dental Caries, Sponsored by The Good Teeth Council for Children, Inc., Chicago, 1938.

toward the anus. There is some retarding action in the stomach and bowel through the agency of reverse and rhythmic peristalsis which promotes fuller digestion and later absorption. The act of swallowing starts the propulsive action of the esophagus which, in turn, causes relaxation of the gastric cardia. Food propulsion waves are initiated at the cardia and advance normally to the pylorus, and then the upper intestinal activity carries the food downward. The food travels from a point of higher irritability to one of lower irritability.[12]

Nervous influences in salivary secretion are well recognized. The odor and taste of food; the type of food; the state of mind, whether worried, fearful, or cheerful, have a definite influence on the quantity and quality of salivary secretion. Illnesses of all kinds likewise have a definite effect on the saliva. The same thing applies to gastro-intestinal and other digestive and internal secretions which have an influence on the entire gastro-intestinal digestive and mechanical activity.

Reverse Peristalsis—Just as extra systoles arise from other points in the heart that develop a high excitability from irritation from infection and toxins, so do reverse gradients occur in the gastro-intestinal tract. Innumerable conditions alter the normal gastro-intestinal gradient and produce reverse peristalsis. Fear has been shown to cause spasm of the gastric cardia. Worry and anger may halt gastric peristalsis. Severe illness of any kind may affect peristalsis. Anemias and nerve influences of central or peripheral origin may influence the normal sequence of gastro-intestinal motility. In gastro-intestinal fluoroscopy, reverse peristalsis in the upper bowel often indicates a point of irritation in the lower bowel.[13]. A coated tongue and "heavy" breath often indicate something wrong in the gastro-intestinal tract. These occur frequently in appendicitis, typhoid, and many other conditions. What all this does to salivary secretion has not been studied. The reverse peristalsis, we see, causes a reflux of gastric material into the mouth. A careful consideration of reverse peristalsis indicates either that there is a loss of irritability of the normal nervous mechanism of the gastro-intestinal tract, or that new centers of irritability have been produced along the tract.

Dental caries in pregnancy is due to the accompanying gastric upsets rather than to the fetus robbing the blood of its lime content. Bad breath that is not of systemic origin or cannot be traced to sinus infection, atrophic rhinitis, putrescent dentine, diseased tonsils, coated tongue, oral food residue, or periodontitis, almost invariably can be traced to a gastric upset. Cankers, erosions, and herpes of the mouth and lips, are frequently present.

During adolescence a person may find himself in an unstable nervous condition and with frequent gastric upsets. At this age the teeth seem to develop caries rapidly. Our complicated civilization with its accompanying worries leads to peptic ulcers and gastric upsets which may cause gastric reflux at any age. Some people regurgitate easily and others almost never. This is most important in considering family susceptibility to caries and can often be a hereditary factor along with familial tendencies to gastric hyperacidity and hypo-acidity.

Action of Gastric Secretions on Teeth—Unless the gastric secretion is entirely anacid (which does occur in most gastric malignancies, many neurotic states, and some anemias), it is apparent that any acid gastric reflux must necessarily destroy the buffer action of the alkaline carbonates and phosphates secreted in the saliva, and so create an "acid mouth." Such a condition would allow any acid produced in dental crevices through bacterial or yeast fermentation to concentrate to the point where damage could occur from solution of enamel. I have seen extensive erosion of the occlusal dental surfaces with dentine exposed which I believe was due directly to regurgitated stomach acid (plus the mechanical erosion from chewing). The anterior and posterior enamel walls usually project with knife-like edges above the more easily eroded dentine. The condition generally came rather suddenly.

Direct Irritation as Cause of Reflux—Probably most important in the consideration of our dental problem is the direct irritation of the gastric mucosa and its nerve endings. The habitual user of strong alcoholic drinks has a constant sour odor to his breath. His engorged beefy-looking throat reflects an irritated gastric mucosa. Our highly spiced and highly variable diet probably also exerts an influence in this direction. Carbonated drinks cause severe gastric upsets in many cases, the carbon dioxide acting as a gastric stimulant and irritant. Sensitization of the gastro-intestinal canal (and its nervous mechanism) to certain foods and other sensitizing agents creates a state of hyperirritability at different points in the gastro-intestinal tract that could easily reverse the normal gastric gradient and cause gastric reflux.

Candy as an Irritant—Above all, it is my belief that while candy may act deleteriously on dental structures through oral fermentation processes and salivary stagnation,[6] the candy also exerts an irritating influence directly on the gastric mucosa. I believe that through this action candy is probably responsible in great part for the present increase in dental caries. Some people eat candy without much evidence of gastric upset, while others develop a "sour stomach" which lasts a week or more by eating only a few candies.

We know that salt, due to its high osmotic and hygroscopic action if taken into the stomach in concentrated form will cause marked gastric irritation to the point of vomiting and collapse. Glucose and levulose (candy) have about one-sixth the osmotic action of salt (0.85 per cent and 5 per cent glucose solutions are isotonic), and cane sugar has about one-half the osmotic action of dextrose or levulose. One important point to remember is that we do not take these saccharides into the stomach in

(*Continued on page* 140)

[12]Alvarez, W. C.: The Mechanics of the Digestive Tract, New York, Paul B. Hoeber, Inc., 1922.
[13]Schnack, A. G.: Chronic Appendicitis, Radiology (July) 1931.

The Editor's Page

IN THE COMMUNITIES throughout the country where consideration has been given to the addition of fluorine to the water supply to decrease dental caries, an apprehension has been expressed that fluorine might have some serious systemic effects. The involvement of skeletal tissue was one of the conditions feared in fluorine toxicosis, with a possible increase in the number of fractures.

In a careful roentgenographic study made among the residents of an Illinois community where the fluorine concentration in the water supply varied from 1.2 to 3 parts per million, Hodges[1] was unable to demonstrate sclerosis of the skeletal tissue even though the water had been used for a long period of time. Hodges made roentgenographic studies of eighty-six persons ranging in age from 7 to 71 years. Roentgenograms were made of the pelvis and the lower part of the lumbar spine. In no instance was osteosclerosis observed.

McClure,[2] in a more recent experiment among 1458 high school boys and 2529 young men taking their physical examinations for the United States armed forces, attempted to show possible skeletal effects of the fluorine intake and "to discover a relation between fluorine ingestion via domestic drinking waters and the height, body weight, and bone fracture experience." McClure reached these conclusions:

1. There was no relation of fracture experience to fluorine exposure. The average height and body weight of all the boys compared favorably with other height-weight data and accepted standards.

2. While these data on bone fracture experience for both men and boys of these ages do not permit final conclusions, they do suggest strongly that no serious impairment in skeletal performance, as might be manifest in the number of broken bones, seems related to exposure to fluorine in domestic water in the concentrations studied in this survey.

McClure and Kinser obtained urine samples for analysis from the same boys and young adults. It was demonstrated that a close correlation existed between the amount of fluorine in the drinking water and the fluorine content of the urine. If the fluorine can be promptly and almost completely eliminated, the toxic dangers are quickly reduced. McClure and Kinser conclude:[3]

"An efficient urinary elimination of fluorine appears to be characteristic of individuals residing in certain fluoride areas of the United States, where the drinking water contains 0.5 to 5.0 parts per million fluorine. The metabolism of fluorine under these conditions seems to be a normal function of the human body and seems characterized by a condition approaching metabolic equilibrium, at least in the adult organism."

It is unlikely that there is any difference in chemical reaction in the fluorine ion that is found in the natural water supply and that which is deliberately added to the water in the form of sodium fluoride. Fluorine in water, however, is only one source of the element. Small amounts are found in food. Fluorine is also used in fertilizers and in sprays for fruits and vegetables. It is unlikely, however, that such trace amounts would be sufficient to produce either dental fluorosis or toxic symptoms.

In the next few years many progressive American communities will consider the addition of the fluorine ion to the community water supplies. Two communities (Kingston-Newburgh, New York, and Grand Rapids, Michigan) have already begun fluorinization projects. It will take twelve or fifteen years before we are certain of the effect the deliberate addition of fluoride in the amount of 1 part per million has on the incidence of dental caries. Meanwhile, if we are certain that no serious systemic toxicity is threatened by the addition of sodium fluoride in 1 part per million, we should not deprive the children of the Nation of the caries preventive promise of fluorinization while awaiting the complete results of the long-time experiments.

[1]Hodges, P. C.; Fareed, O. J.; Ruggy, George; and Chudnoff, J. S.: Skeletal Sclerosis in Chronic Sodium Fluoride Poisoning, J.A.M.A., 117:1938 (December 6) 1941.

[2]McClure, F. J.: Fluoride Domestic Waters and Systemic Effects, U. S. Public Health Reports, 59:1543 (December 1) 1944.

[3]McClure, F. J., and Kinser, C. A.: Fluoride Domestic Waters and Systemic Effects, U. S. Public Health Reports, 59:1575 (December 8) 1944.

(*Continued from page* 138)

concentrated form except as candy. One tablespoonful of honey by itself is about all an ordinary person can take without nausea, but honey or corn syrup spread on bread or wheatcakes and eaten with a fluid beverage may produce no apparent gastric irritation inasmuch as great dilution prevents irritation.

More people have upset stomachs from candy and alcohol after a holiday season than at any other time. Drinking water freely or taking food while eating candy perhaps would eliminate the tendency to gastric irritation. It is true that salivary amylase does not break starches down to the simple saccharide stage but stops at the polysaccharide stage. Polysaccharides have no irritating osmotic or hygroscopic action on the gastric mucosa. The stomach has little absorptive power; therefore, if the starches which form such a large part of our diet were reduced by the salivary amylase to simple sugars, we would not be able to utilize them because of their irritating effect on the gastric mucosa. Nature has been wise in stopping the reduction at the nonirritating polysaccharide stage. It is only after these polysaccharides enter the small bowel that the pancreatic juice reduces them to the simple sugars. Great dilution through pancreatic juice (600 cubic centimeters daily), bile (400 cubic centimeters daily) and succus entericus (3000 cubic centimeters daily), and rapid absorption, prevent the concentrated action of the sugar on the bowel wall.

Comments

While it is probable that caries in crevices and interproximal areas may develop to some degree in people who show no evidence of gastric reflux, the severe caries must be associated with gastric reflux which destroys the salivary buffer action, the main protection of saliva against dental caries. Bacterial or yeast oral fermentation may likewise still be important.

Taking several vitamin D capsules on an empty stomach shows the ease with which gastric eructation takes place. The taste and odor are recognized easily. Eating chocolate candy before retiring, despite careful cleaning of the mouth (including brushing the tongue) will create in many people an acid mouth with teeth "on edge" in the early morning hours; this is caused by gastric regurgitation. A single swallow on waking eliminates the greater portion of accumulated acid so that even a microchemical analysis for acid concentration of saliva during sleeping hours would be a most difficult task. There is rarely if ever any real accumulation of saliva, but the litmus test will show a strong acid reaction. The presence of gastric acid in the mouth even in small amounts, therefore, must be considered a causative factor in dental caries.

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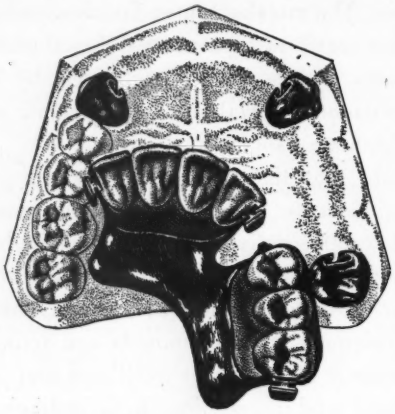

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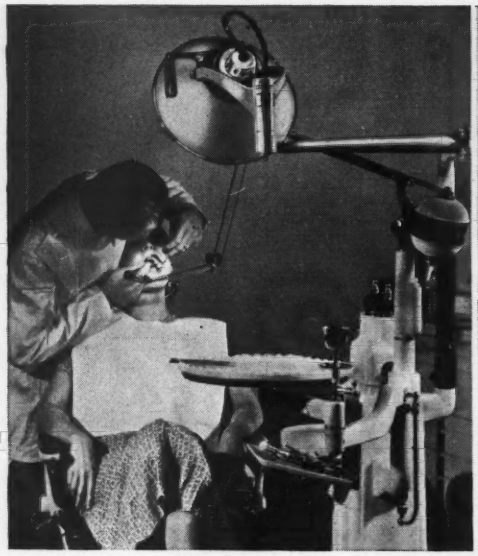

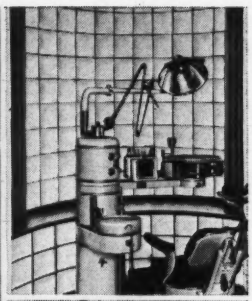

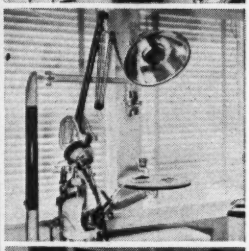

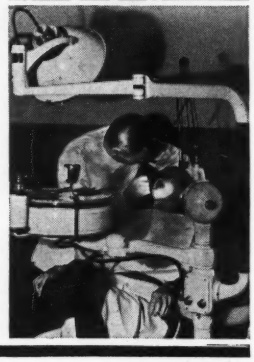

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Contra-Angles

Watch Stassen . . .

Almost a year and a half ago at the Cincinnati Meeting of the American Dental Association, I talked with some of the boys from Minnesota over the beer mugs about Governor Stassen, who had recently joined the Navy. The opinion was expressed by several of these Minnesota dentists that there was a clear-cut, long-term pattern in Stassen's appointment. The pattern was something like this: Stassen was to go in the Navy; he was to be given increasing responsibilities; in time he would be given an important assignment and would be definitely in the forefront when the Japanese were finally defeated in battle. He would return to the United States with the hero's laurels upon his brow; he would be widely acclaimed; he would be embraced by Mr. Roosevelt; and, although a Republican, he would fall heir to the liberal mantle of F. D. R.

All this sounded preposterous a year and a half ago, but events have developed to make the theory seem more plausible. Commander Stassen has been cited by Admiral Halsey for "his alertness, skill, and aggressiveness in keeping with the highest traditions of the Naval service." This citation was given to Stassen for his distinguished service while the forces of the Third United States Fleet were engaging the Japanese.

Now Commander Stassen has been appointed as one of the three Republican delegates to the United Nations Conference that convenes on April 25 in San Francisco. Here is what the political dopesters are saying in Washington:

"Designation of Stassen—who will probably hold his rank as commander in the Navy while serving as a dele-

gate—stirred Washington political prophets to immediate speculation. Their question: 'Is President Roosevelt, realizing that a Republican may be elected President in 1948, maneuvering to keep Stassen in the public eye because he is the outstanding advocate of international collaboration in his party?'

"Recalling that a Republican Senate mangled every chance of United States collaboration in a world peace organization after the last war, F. D. R. may well have an idea that Stassen would make a desirable Republican nominee in 1948."

This is exactly what the *dental* dopesters were saying in Cincinnati in October 1943. They were a year and a half ahead of the paid prognosticators in Washington.

So Sorry . . .

One of an editor's unpleasant jobs is to send out rejection notices. Some editors are coldly inhuman and send out printed, terse slips. The Chinese, however, with their usual tact, do the job with warmer understanding and more finesse. Here is a copy of a Chinese rejection slip:

"We read your manuscript with boundless delight. By the sacred ashes of our ancestors, we swear that we have never dipped into a book of such overwhelming mastery. If we were to publish this book it would be impossible in the future to issue any book of a lower standard. As it is unthinkable that within the next 10,000 years we shall find its equal, we are, to our great regret compelled to return this divine work, and beg you a thousand times to forgive our action."

Farm Sale . . .

Recently when a long-time friend and I were walking through the snow banks over the country roads on a zero day, we were stopped by a farmer who asked if we knew the place where the farm sale was being held. We did not know. In time, however, we came to the parked cars along the road and heard the stentorian auctioneer at his work.

(*Continued on page* 144)

A Texas Dentist has just written:
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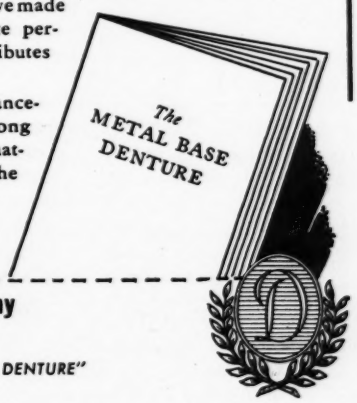

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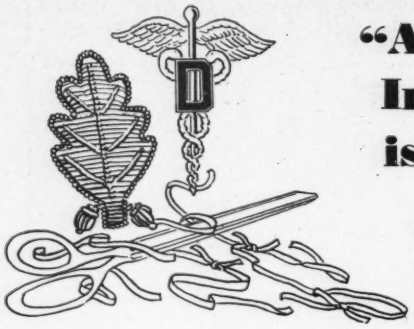
D 3

In your ORAL HYGIENE this month



"A Congressional Investigation is Needed"

In plain words, and naming names, the editor calls for a congressional investigation! . . . This decisive action culminates the long fight for release of the Dental Corps of the Army and Navy from the domination of the Medical Corps. You will not want to miss the editorial on page 444, nor the editorial from the *Chicago Sunday Tribune* (reprinted on page 442). The *Tribune* editorial discusses the report of a congressional committee that has been investigating Army hospitals . . . Neither editorial minces words, and both are "*must*-reading" for dentists interested in their profession and in the welfare of the personnel of the armed forces.

★ ★ ★

The March issue contains articles on almost every phase of contemporary dental life. There is the article "Postwar Success for Service Dentists," by Saul Levy, D.D.S.—which might well be titled "*Everyday* Success for *Every* Dentist," for Doctor Levy's keen analysis of the requisites for successful practice can be of as much help to the dentist now practicing as to the dentist entering, or returning to, private practice.

★ ★ ★

"Psychology in Contracting," by Ellsworth Bruce, D.M.D., LL.B., will help many dentists—and their patients too—in solving the credit problem. Doctor Bruce explains in detail how to present terms tactfully, without embarrassment to either the dentist or the patient . . . and, too, how to formulate a credit plan that will minimize the risk of "bad debts."

★ ★ ★

"Any trend that leads to a *national* health plan is the result of the failure of professional leadership to guide science for the benefit of all," says Stanley C. Brown, D.D.S., in the article, "Federated Planning for Health Care." Doctor Brown further says, "It is not necessary, and certainly not advisable to wait until our congressmen present *us* with a plan. We should present them with *our* plan." . . . You may not agree with Doctor Brown's plan as outlined in the article, but you will approve his clear, concise treatment of a subject all too often muddled by vague, lengthy circumlocution.

★ ★ ★

Did you know that a *dentist* produced the motion pictures, "Hitler's Children" and "The Master Race"? . . . You will find the story on page 426.

★ ★ ★

Martyr to his long research into the mysteries of the cathode ray, C. Edmund Kells died after giving dentistry the first technique for use of the x-ray. Doctor Kells is one of those dentists to whom the whole profession is greatly indebted. His technique is the basis of all subsequent x-ray techniques, and an important part of current, everyday practice. To realize what you, yourself, owe to Doctor Kells, read the article by Doctor Bainess A. Goldblatt, on page 418.

★ ★ ★

"Help to Dentists in War Areas," by Kent Kane Cross, D.D.S., raises an important question: How far does our intra-professional obligation extend? Doctor Cross pleads for help for colleagues in devastated countries —help that would be of incalculable value in bringing to the people of those countries, the health care so long denied them by the War. He says: "Our *interests* are world-wide. Our *activities* should be." . . . You will find the article on page 435.

★ ★ ★

Eight departments give news, views, treatments, techniques, a bit of philosophy, and a page of smiles. The whole issue is designed to be read in short snatches—that being the way dentists' reading time comes these days.

(*Continued from page* 143)

A farm sale is somewhat like an auction in the city, but with a little more lustiness. It is also something like a dental convention, partly social and partly professional. The farmers get together to talk about the prospects for the next planting, the price of grains and produce, even as dentists boast of their "cases" and their fees. Farmers also hope to pick up a few knickknacks at a bargain—a piece of fence wire, an old cream separator, some tools, or maybe even a tractor. Farmers attending a sale do not, however, seem to be quite as noisy as a bunch of dentists at a meeting, and they appear to have far better complexions; they have none of the pallor nor the stoop of the dentist. Farmers, like dentists, are great individualists. They are hard people to standardize. They resent government control and regulations. They would resent trade unions. In common with professional men, they seem to be about the last of the individual, non-regulated producers—the last free men.

You Are Not Getting the Truth . . .

Standing between the public and all dictators are editors and journalists who should take their responsibility with great seriousness—the responsibility that the public should know the truth, whatever the truth may be. So long as the press is free, we should have no fear of dictators or of insolent bureaucrats. The people who do not want a press that is free, whether they are dental reformers like the American College of Dentists or the kind of fascists we see in public life, are anxious to see news curtailed and suppressed, censored with their own preconceptions, slanted and distorted to fit their own preconceived ends.

In the case of American dentistry, the American College of Dentists has set itself up as a little private agency to suppress free expression in the dental field. The chairman of the Committee on Journalism of the American College of Dentists has

(*Continued on page* 149)

never distinguished himself in the field of dental writing. He has never been an editor of anything, nor has he ever published any papers of any value or significance. He has had no practical journalistic experience. But he and a few of his commission members presume to tell 70,000 dentists what they should read, who should write it, and where it should be printed. This is fascism, although in the case of the American College of Dentists it hides behind self-righteousness and sanctity. It would be just as disastrous to the American way of life if every dental publication carried the stamp of standardization and subservience to a common master as it would be if every magazine and newspaper, as in Germany and Japan, uttered the same pronouncements and slanted news.

We have a fine example of what can happen when any self-appointed agency, be it governmental or something else, takes it upon itself to suppress the truth. A prominent newspaper publisher, returning from military service, has this to say about military censorship:[1]

"And speaking of the war—did you know that you are NOT getting the truth about what's going on? You didn't? Well, well! That's a hot one.

"No, sir, you haven't been getting the truth since before the war started and up to now. A lot of hooey is being given you about 'military secrets' and 'security.' Of course, there are plenty of both and rightly so, but most of this baloney about 'security' is so much horsefeathers. Some of it comes from sheer stupidity. Some from an effort to cover up. Some from the desire to keep up your morale. And some of it, just from plain downright determination to keep you and you and you in the dark.

"You aren't getting the truth about what's going on in Europe. You're entitled to know it. After all, this is YOUR war whether you like it or not. They're YOUR boys who are doing the fighting. And a wonderful job, too. And it's YOUR money that

(*Continued on page* 150)

[1]Brown, R. U.: Shop Talk at Thirty, Ed. & Pub., 78:80 (January 13) 1945.

50% Reduction in Exposure Time

NEW EASTMAN BITE-WING X-RAY FILMS

with Radia-tized Emulsion

1945 completes the second decade since the introduction of Eastman *Bite-Wing* Dental X-ray Films, one of dentistry's greatest diagnostic aids. Now, because of widespread requests, all *Bite-Wings* will be supplied with Eastman's well-known, faster Radia-tized emulsion. *Bite-Wings* will come to you in the same familiar packet, but with emulsion speed that permits a 50% reduction of the exposure time formerly required.

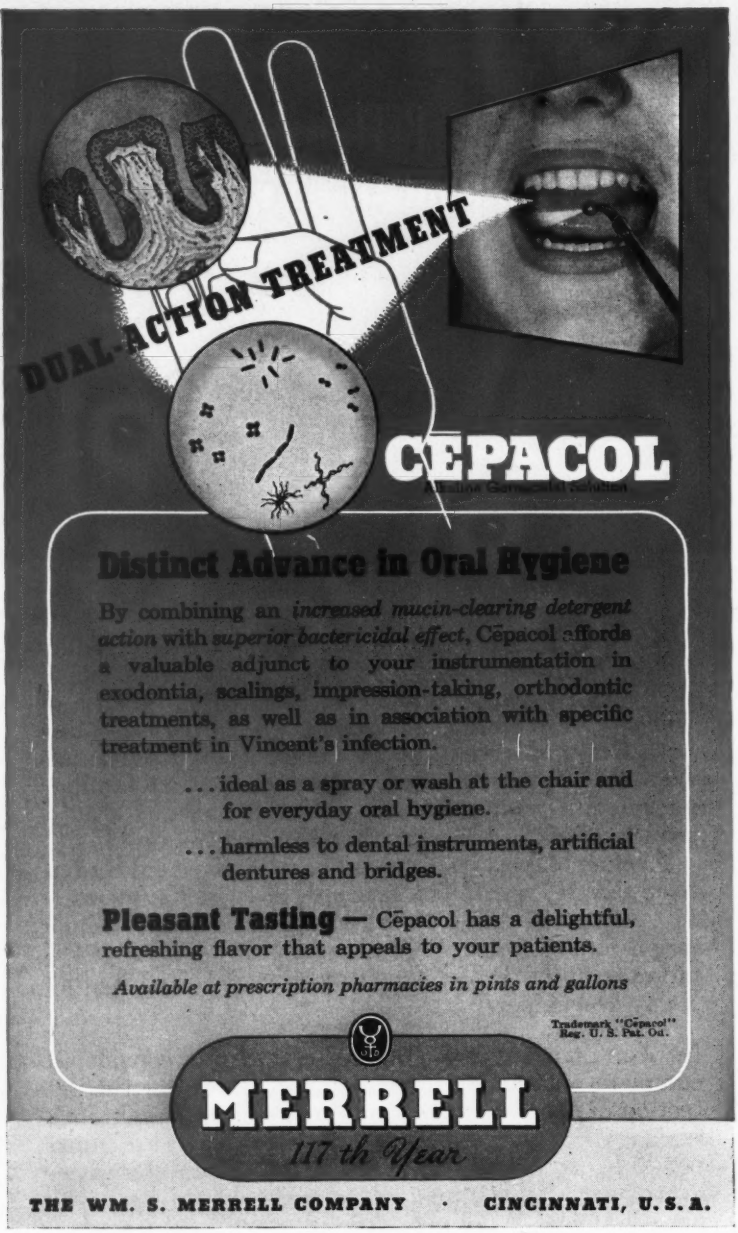
Average exposures for adults, with the new Radia-tized *Bite-Wings:* 1½ to 3 seconds at 10 milliamperes—110 volts (65 kilovolts—3-inch spark gap); 8-inch target-film distance. Recommended development: 4½ minutes at 68°F., in Eastman Concentrated Liquid X-ray Developer.

• • •

No examination of the oral cavity can be considered complete without an interproximal survey for the detection of possible carious conditions of proximal tooth surfaces. For such a survey, *Bite-Wing* Films are indispensable. A *Bite-Wing* examination should be given every new patient, and *all* patients should have the benefit of *Bite-Wing* radiography at least once a year.

Order the new Radia-tized *Bite-Wings* now from your regular dealer. To educate patients in the effectiveness of *Bite-Wing* examinations, write for free folder showing enlarged reproduction of a *Bite-Wing* radiograph, and a copy of the booklet, *How to Prevent Toothache*, by Howard R. Raper, D.D.S. . . . Eastman Kodak Company, Medical Division, Rochester 4, N. Y.

In x-ray films the complete line is EASTMAN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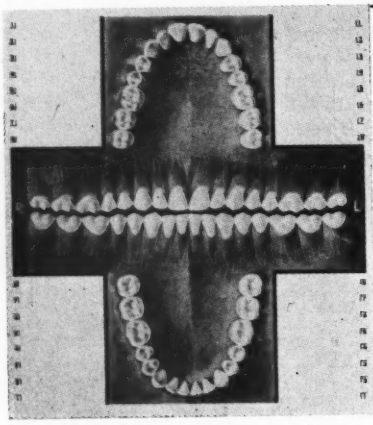

Permanent Records Are Important . . .

Do you have a permanent record of the mouth of each of your patients? This type of record is tremendously important, and easy to accomplish. Use the Ryan Treatment and Examination Chart as illustrated here. It is being widely used and is acclaimed the most practical chart for record purposes. Use it on *one case* . . . and you will want to use it on *every* case. The coupon is for your convenience.

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Here is $1.00 for a pad of 50 Ryan Examination and Treatment Record Charts.

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is paying for the guns and tanks and ammunition and ships and planes and bombs and all the rest of the stuff.

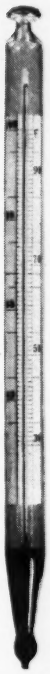
"But YOU aren't being told what's happening, because somebody has pulled a boner or because somebody else thinks you're too soft to stand the shock that the real truth would produce. So you're being kept in the dark until somebody makes up his mind that the worst is over and that you and I are ready to be fed the facts in broken doses.

"So, if you think you're entitled to the truth, even in broken doses, sit right down and write your Congressman and your Senators—and don't pull any punches. Just raise unshirted hell about the stupid censorship that is being clamped on the mess in Europe and elsewhere, and demand that as your representatives in this so-called democracy, they, too, raise unshirted hell, individually and collectively, with the proper parties and bring an end to the hush-hush that keeps nothing from the enemy but deprives YOU of the things you're entitled to know.

"If YOU aren't interested, I'm certain nobody is going to do this for you. So get busy. Deluge Washington with demands for the TRUTH. and maybe you'll begin to get a smidgin'."

Wherever intolerance shows its ugly face or wherever you hear anyone suggesting that something be suppressed and hidden, you are looking straight in the face of an enemy of democracy. Wherever a dental group, such as the American College of Dentists, arrogates to itself the privilege of telling dentists what they should read, when, how, what, or why, you are looking at an aspiring dictator and an enemy of the American way of life. I prefer the far-seeing guarantees in the Bill of Rights to the short-sighted arrogances of the reformers. Fuehrers are going out of fashion—so indeed may be various brands of "Fellows" in dentistry.—E. J. R.

CORRECT SOLUTION TEMPERATURE ASSURANCE



Designed expressly for darkroom use, the G-E Floating Thermometer is made of heavy, crystal-clear glass—shows solution temperature changes of one degree throughout its entire scale. Block-lettered numerals and characters and a quickly distinguishable blue liquid column assure easy reading under processing-room lighting. An exceptionally accurate guide to better film-processing, this well-made instrument is a dental darkroom "must."

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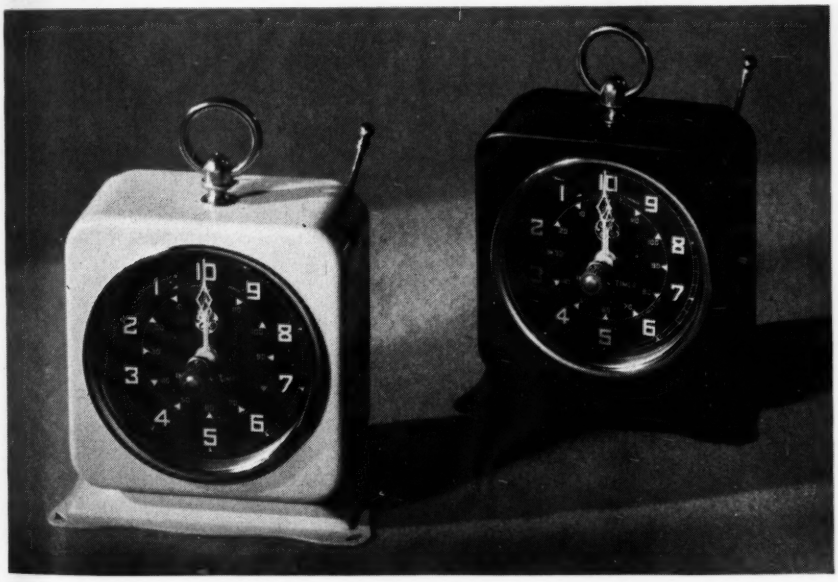

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The Surgical Retention of Full Dentures

L. LAKNER, MD., D.D.S.
Edinburgh, Scotland

General Considerations

A full denture is usually retained in position by virtue of atmospheric pressure and adhesion. The usual means of denture retention are inadequate, however, in jaws with low alveolar ridges. In such cases recourse must be had to surgical formation of a groove, or to the surgical preparation of the jaws for the employment of other retentive means.

Technique for Surgical Retention

1. The relation of the maxillary sinuses to the alveolar ridge is established by means of roentgenograms.

2. The incisions are made in the mucous membrane on both the buccal and palatal sides.

3. A large fissure bur is used to drill a canal to link the buccal and palatal sides. The position of the canal should correspond approximately to the cuspid or the first bicuspid, and it should run obliquely toward the palate. The opening of the canal must not be placed too high on the buccal side inasmuch as the lock device and the head of the bolt may interfere with the folds of the buccal mucous membrane.

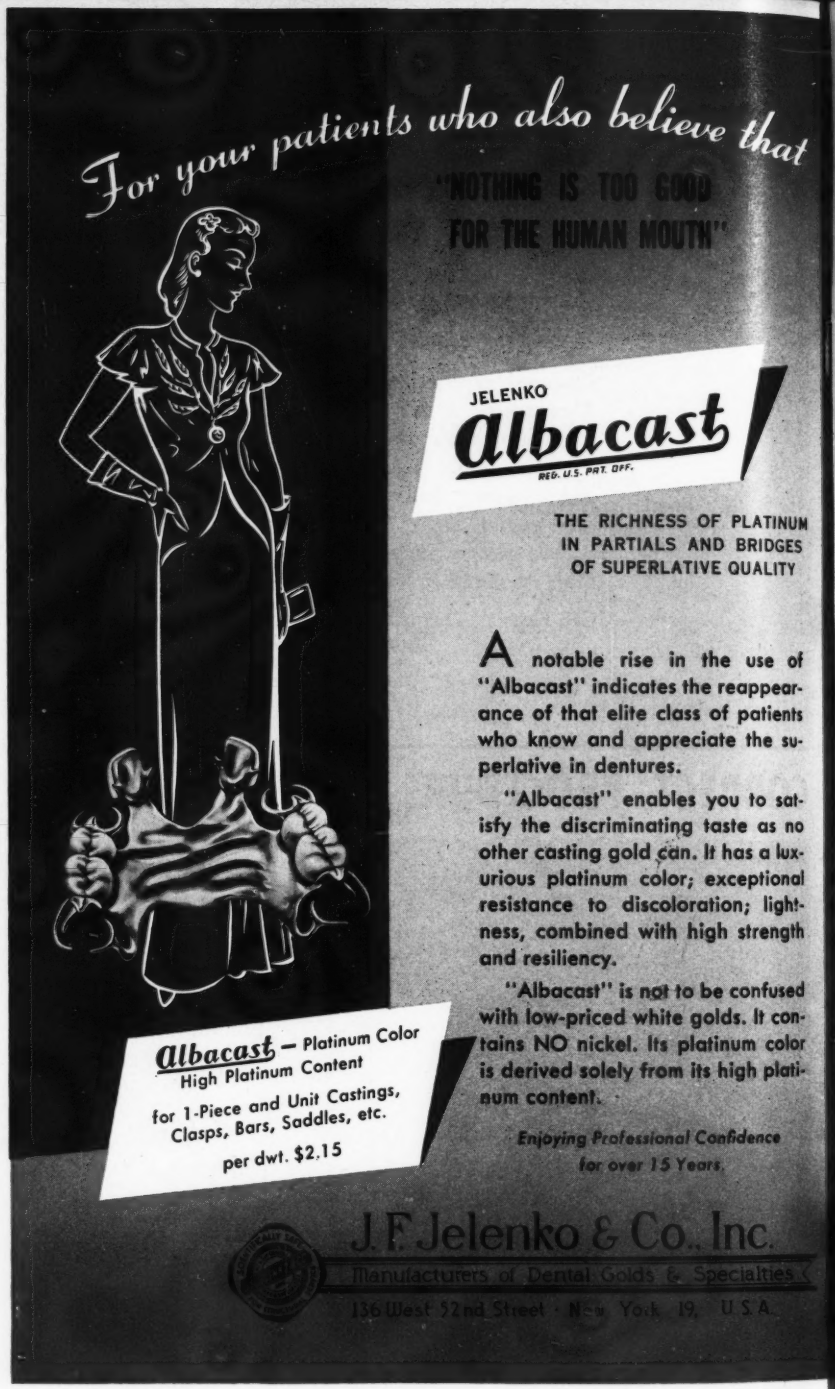
4. The mucous membrane is pushed inside the canal and adjusted to the walls by means of a wire properly gauged, the wire being left inside the canal until complete healing has taken place. *Never* leave the canal without a wire or bolt inside, or difficulties may be encountered in subsequently inserting the bolt. The wire or bolt should possess a flattened buccal end to ensure its retention in the canal. The palatine ends of the bolts must be separated from the palate by a piece of gauze or rubber dam, thus providing extra space between the denture and the palate.

5. After the operation the canal should be irrigated daily with hydrogen peroxide.

6. A correction impression of plaster of Paris can be taken for the construction of the denture about three weeks after the operation. Bolts, constructed to fit the canals, should be of such a length as to project about 1/6 inch on the palatal side. The impression is taken with the bolts in position, the latter to be removed, however, before removing the impression from the mouth.

7. The skeleton denture is cast in gold to cover the palate. The rest of the denture is finished in vulcanite or a plastic as usual, except that a properly devised lock must be fitted on the buccal side to provide support for the buccal end of the bolts.

8. Attention must be given to the proper occlusion of the finished den-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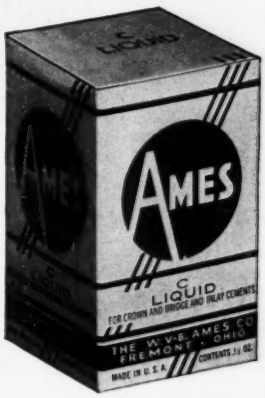
tures; any lack of balance in articulation will cause a one-sided pressure on the retentive device, thus interfering with mastication. The palatal ends of the bolts must be blunt, and the buccal ones must be so constructed as to form a lock with the denture when turned 90 degrees. The lock device must be easily manipulated by the patient.

—*From The Dental Record*, 64:277 (December) 1944.

BUY WAR BONDS AND STAMPS



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Treatment of Acute Hematogenous Osteomyelitis

FRANK D. DICKSON, M.D.,
Kansas City

IN VIEW of the established surgical principle that a focus of infection with tissue destruction must be drained, it does not seem logical to depart from this principle when dealing with an abscess in bone. Bone is a tissue which, when infected, has little defense and poor recuperative power except in infants. For this reason bone tissue infection would seem to demand drainage even more urgently than an abscess of the soft parts in order to relieve the general toxemia, reduce to a minimum the amount of bone destruction, and lessen the danger of reinfecting the blood stream with the probable development of metastatic abscesses. On this basis, my position in treatment has been drainage of the local bone abscess at the earliest moment; that is, at the earliest moment that the patient's general condition will permit, except when an acute onset with a chill, grave constitutional symptoms, and lack of signs of a definite bone localization indicate a septicemia.

Treating a bone abscess with the sulfonamides and without drainage may result in putting out the fire; but the ashes remain, and only too frequently ashes which have embers likely to be fanned into activity by such breezes as lowered resistance or local trauma to the quiescent area. My observations have convinced me that sooner or later a large percentage of these quiescent foci do become active. Whether penicillin proves to be an agent which, more powerful than the sulfonamides, will completely sterilize such areas of infection only time will tell. Until then the preponderance of evidence is in favor of early drainage of the osseous focus in acute hematogenous osteomyelitis

(*Continued on page* 156)

WITH POLIDENT

THERE'S no easier way to clean dentures than by *soaking* them clean in POLIDENT. Nor is there any better way. For POLIDENT literally *dissolves* mucin, tarnish, food debris and odors... *soaks* them clean without the slightest danger of injury!

POLIDENT is recommended by thousands of dentists everywhere for safe denture-hygiene. *Safe* because it eliminates the handling required by brushing, and consequent danger of dropping. *Safe* because its *non-abrasive* action insures freedom from scratching or wear.

As an extra service to your denture patients, may we suggest that you recommend POLIDENT?

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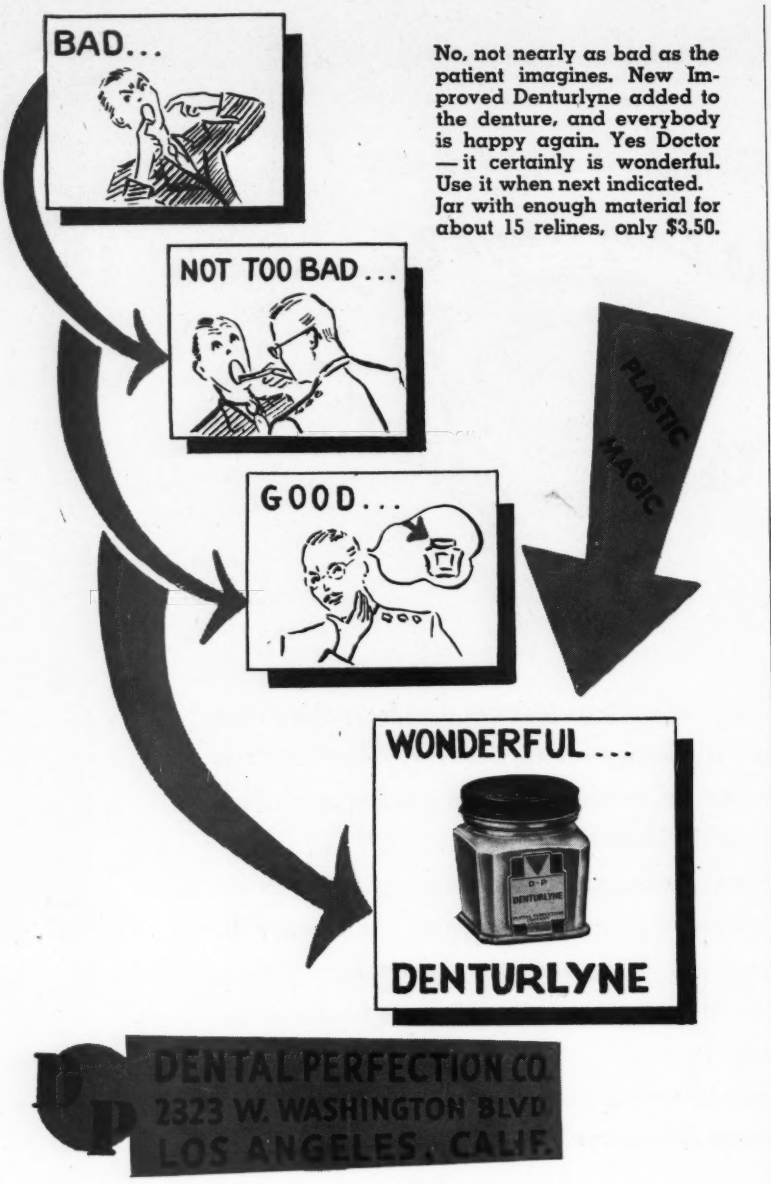
SOAK *10 to 15 minutes in solution. (1 glass water to ½ tsp. POLIDENT).*

RINSE *Hold under running water to rinse. That's all!*

APPROVED *for use by leading manufacturers of acrylic denture materials.*

POLIDENT

—to keep dentures fit!



No, not nearly as bad as the patient imagines. New Improved Denturlyne added to the denture, and everybody is happy again. Yes Doctor — it certainly is wonderful. Use it when next indicated. Jar with enough material for about 15 relines, only $3.50.

THE RED CROSS
NEEDS YOUR
HELP
Contribute Generously

except in the fulminating type with septicemia and pyemia, when the drainage of a single focus, where there are probably others present, cannot be expected to have any helpful effect but will probably do harm. —Excerpt from *The Journal of the American Medical Association*, 127:-212 (January 27), 1945.

Penicillin in Treatment of Vincent's Angina

Lieutenant R. M. COLEMAN (MC) USNR

RECENT EXPERIMENTAL work concerning the use of penicillin in various spirochete and spirillum diseases led to the view that this substance might be useful in the treatment of two patients with Vincent's angina.

Findings

1. "Sore throat" of twenty-four hour duration.

2. Hyperemia and passive congestion of the pharyngeal mucous membranes.

3. An oval-shaped, yellow-gray pseudomembrane about 1.5 centimeters by 2 centimeters on the right tonsil of one patient and on the left tonsil of the other. This membrane, when removed, revealed a bleeding, raw ulcer. There was pain on pressure with a tongue blade, and the breath was foul. Smears from both lesions showed a great predominance of the spirilla and fusiform Vincent's bacilli.

4. The temperatures were 99.8° F. and 102.2° F. respectively.

Treatment

The treatment consisted of intravenous injection of 100,000 units of penicillin, divided into five injections at two-hour intervals. No untoward reactions were observed. No other measures of any type were employed. The usual sanitary precautions were observed.

(*Continued on page* 158)

NATURAL BRISTLES ARE BACK ON PY-CO-PAY BRUSHES

A recent national survey of dentists showed that genuine natural bristles were preferred 3 to 1. Now the Py-co-pay brush, adult size, is available with natural bristles—black—extra hard. Tell your patients to ask for Py-co-pay "Natural."

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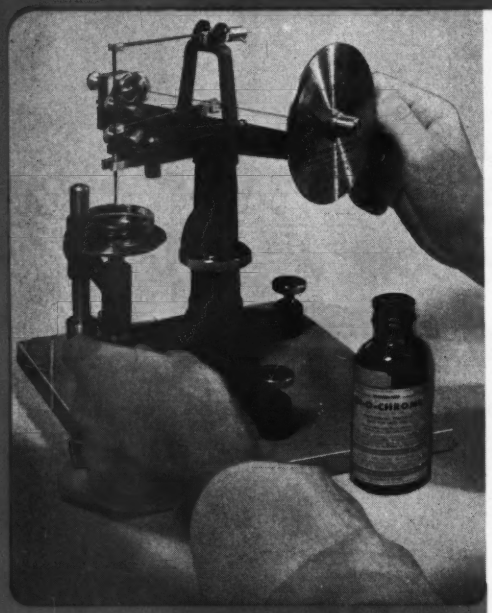
PY-CO-PAY TOOTH BRUSHES

Di-O-Chrome FOR VINCENT'S DISEASE



The surface tension of Di-O-Chrome is determined by means of the du Noüy Tensiometer

Reaches the seat of infection

★ DI-O-CHROME kills the Vincent's Disease organisms in gingival crevices and permeates the living tissue to the source of trouble. Di-O-Chrome possesses low surface tension and high wetting properties so necessary to the intimate contact and destruction of the infecting organisms.

And Di-O-Chrome has no cauterizing action — it builds up no progressive resistance to treatment during a series of applications because it does not coagulate the tissue. Di-O-Chrome is the treatment of choice for Vincent's Disease.

AVAILABLE IN TWO STRENGTHS

DI-O-CHROME
Professional Strength

DI-O-CHROME
For Home Use

Details of treatment — and dietary correction of Vincent's Disease — will be found in the booklet furnished with the Professional package — or on request.

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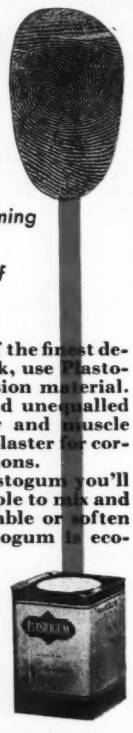

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Easy to mix

Is pleasantly flavored

Accurate muscle trimming

Accurate recording of periphery

For exact registration of the finest detail in full denture work, use Plastogum—the ideal impression material. It is highly accurate and unequalled for recording periphery and muscle trimming. Superior to plaster for corrective or wash impressions.

Once you've used Plastogum you'll always prefer it. So simple to mix and handle, it will not crumble or soften from absorption. Plastogum is economical to use and patients like its pleasant flavor and the fast, easy way you can take impressions without discomfort. Try Plastogum. Write today for your *free sample.*

FREE Sample

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(*Continued from page* 156)

Results of Treatment

Twenty-four hours after completion of treatment, the patients had no complaints. Their temperatures had returned to and remained normal. At this time the pseudomembranes had disappeared; the ulcers were "clean" looking and did not bleed. After forty-eight hours there was a definite appearance of healthy granulation tissue, and at the end of ninety-six hours both ulcers had healed completely. No further complaints or symptoms were noted.

—From *United States Naval Medical Bulletin*, 44:116 (January) 1945.

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Have you examined and tested our BS Polisher? Why not use the coupon below and see for yourself how this soft, flexible rubber polisher makes a patient feel safe and comfortable. See how thoroughly clean and bright it polishes every tooth. Only then will you understand why more dentists every day prefer BS Polishers.

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Speed the ability

"He who laughs *least* — laughs best" . . . is too often the fearful attitude of the new-denture patient. Not because his dentures don't fit — but because it takes a little practice for him to "learn to laugh" again, with freedom and confidence.

In order to enable patients to master their carefully fitted dentures more quickly, many dentists have the considerate forethought to recommend Wernet's Powder during the first few weeks of use. Wernet's Powder aids retention by contributing to the maintenance of a *perfect valve seal.* It helps to *distribute pressure,* and forms a *soft protective cushion.*

Just a light dusting of Wernet's Powder is usually all that's needed to give that *extra* degree of retention, and that *extra* spark of confidence, to help the patient over the difficult "breaking-in" period.

WERNET'S POWDER

ADAPTS THE PATIENT TO THE DENTURE

FREE SUPPLY on Request

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DENTAL MEETING

Dates

(State dental society meetings have in some cases been cancelled, but no word has been received about those listed below.)

•

Old Dominion Dental Society, thirty-second annual meeting, Charlottesville, Virginia, April 2-3.

•

New Jersey State Board of Dental Examiners, regular meeting, Trenton, April 23-27. All applications, along with the examination fee of $25.00, must be in the hands of the secretary on or before March 1. For information write to Doctor J. Frank Burke, 150 East State Street, Trenton.

•

The New York Institute of Clinical Oral Pathology, monthly conference, New York Academy of Medicine, April 30.

•

The Dental Society of the State of New York, seventy-seventh annual meeting, Hotel Pennsylvania, New York City, May 14-17.

•

Tennessee State Dental Association, seventy-eighth annual meeting, Hotel Andrew Johnson, Knoxville, May 14-17, 1945.

•

Indiana State Dental Association, eighty-eighth annual meeting, Claypool Hotel, Indianapolis, May 21-23.

•

New Mexico State Dental Society, regular meeting, Albuquerque, May 21-23.

•

Ontario Dental Association, seventy-eighth annual meeting, Royal York Hotel, May 28-30.

•

Ohio State Board of Dental Examiners, regular meeting, Western Reserve University, Cleveland, May 21-23; Ohio State University, College of Dentistry, Columbus, June 4-6. All applications must be in the hands of the secretary at least ten days prior to examination. For information write to Doctor Earl D. Lowry, 79 East State Street, Columbus.

•

California State Board of Dental Examiners, regular meeting, Los Angeles June 4, and in San Francisco at Physicians & Surgeons College of Dentistry on August 6. For information, write to Doctor Kenneth I. Nesbitt, 515 Van Ness Avenue, San Francisco.

•

Florida State Board of Dental Examiners, regular meeting, Seminole Hotel, Jacksonville, June 18-21. For information write to Doctor A. W. Kellner, P. O. Box 155, Hollywood, Florida.

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Maine State Board of Dental Examiners, regular meeting, State House, Augusta, June 18-20. For information write to Doctor Carl W. Maxfield, 31 Central Street, Bangor.

•

Delaware State Board of Dental Examiners, regular meeting, Wilmington, June 20-22. For information write to Doctor Charles R. Jefferis, Medical Arts Building, Wilmington.

Virginia State Board of Dental Examiners, regular meeting, Medical College of Virginia, Richmond, beginning June 19. For information write to Doctor John M. Hughes, 715 Medical Arts Building, Richmond.

•

North Dakota State Board of Dental Examiners, regular meeting, Gardner Hotel, Fargo, July 9-12. For information write to Doctor Richard Krause, Bismarck.

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1. *Compensating Arms* which move forward or backward as the chair back is raised or lowered, thus assuring *full* arm support at all times and keeps the patient's head in proper operating position.
2. *Back-Lifting Device* activated by a spring mechanism built into the compensating arms. Materially aids in raising the chair back and the patient from or to any desired operating position. This compensating spring feature applies a slight pressure to the patient's back which with the forward movement of the arms, automatically prompts them to help themselves up to a sitting position. Think of what it means to eliminate the strain of lifting the dead weight of both the patient and the chair back and you have the appreciated answer to this practical idea . . . an *exclusive* Weber development which is now a "built-in" feature of Weber Model "F" Chairs.

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"When the doctor decided to install a nitrous oxide gas machine he wanted a machine that would give him instant control of the patient, simplicity in technic, prompt anesthesia, instant accurate control at all times and economy in gas consumption. He chose the Nargraf because it was, in effect, designed to his specifications. The Nargraf is now the *other* assistant in our office."

The results of almost thirty-five years intimate study of the operator's problems in nitrous oxide anesthesia are built into the McKesson Nargraf. It has, in effect, been designed by dentists, themselves. That is why we say—*know the Nargraf and the Nargraf will be your choice of a gas machine.*

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See second cover D.D.3

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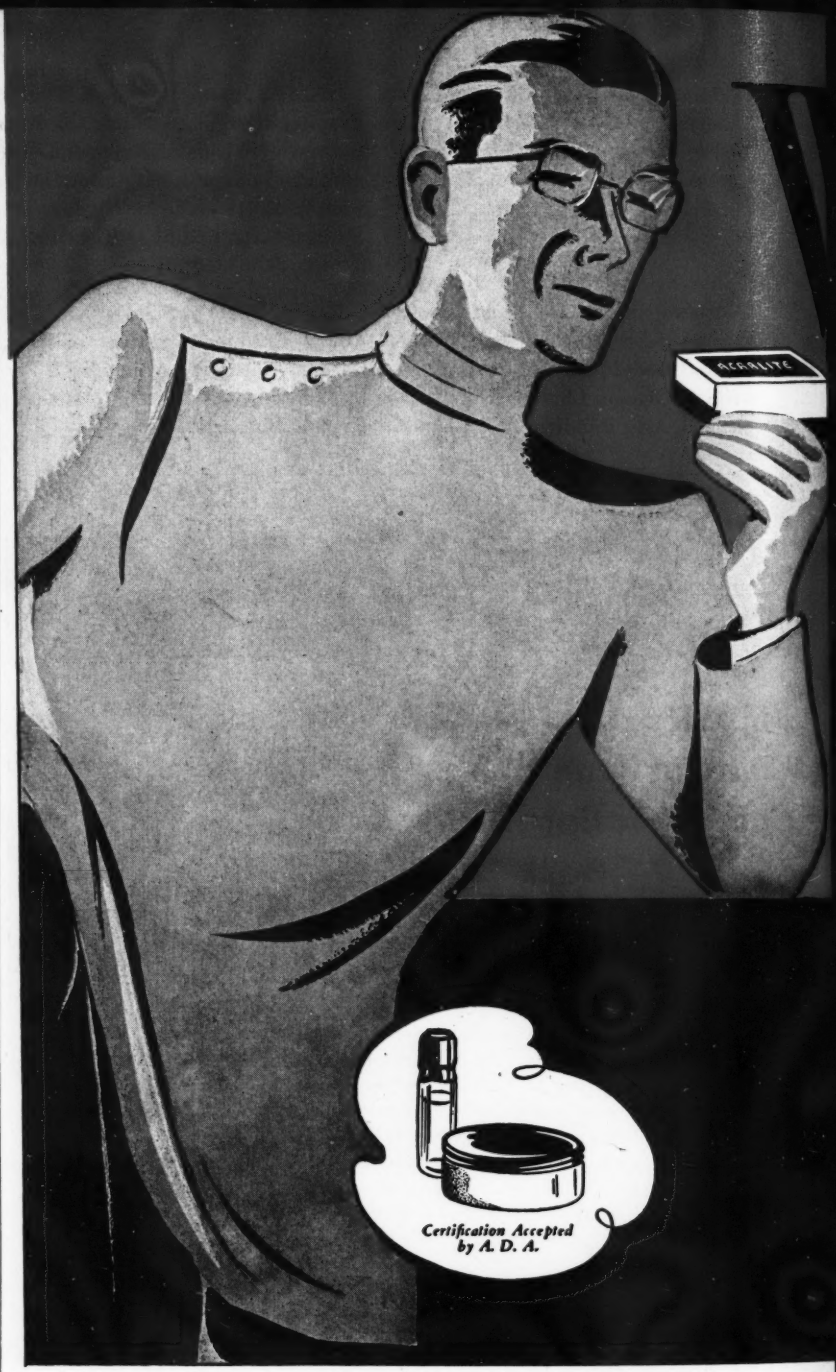

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